THE newe Attractiue,

30

Containyng a ſhort diſcourſe
of the *Magnes* or *Lodeſtone*, and
amongeſt other his vertues, of a newe
diſcouered ſecret and ſubtill propertie,
concernyng the Declinyng of the
Needle, touched therewith
vnder the plaine of
the Horizon.
Now firſt founde out by *Robert
Norman* Hydrographer.

¶ Herevnto are annexed certaine
neceſſarie rules for the art of
Nauigation, by the
ſame *R. Norman*.

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¶ To the right worſhipfull Maiſter *VVillyam Borrough, Comptroller of her* **Maieſties Nauie:** *Robert Norman* **wiſheth encreaſe of worſhip in perfecte felicitie.**

ARchimedes after long ſearche made to finde out the fraudulent mixture of king Hierons goldẽ crowne could not by any means attaine the ſecret thereof, till at length by chaunce as he was bathyng hym ſelf, he obſerued that ſtill as his bodie entred into the water, it forced the ſame to riſe and runne ouer the veſſell, wherevpon the matter of the crowne commyng to his remembrance, and appliyng the maner of the water to his preſent purpoſe, he was forthewith mooued with ſuche exceedyng ioye, that he leapt ſodainly out of the water, and forgettyng hymſelf to be naked, came criyng to the Kyng his maiſter, I haue found, I haue founde. So I (right worſhipfull) (although in other reſpectes and poinctes of learnyng & knowledge, I will not preſume to cōpare with Archimedes, who is many waies incōparable, nor with any other *learned Mathematician, beyng my ſelf an vnlearned Mechanician) by occaſion of my profeſſion, making ſundrie experiments of the Magnes ſtone, founde at length amongeſt many other effects, this ſtraunge and newe propertie of Declinyng of the Needle, whiche forgettyng or rather neglectyng myne owne nakedneſſe and want of furniture to ſet forthe the matter, I haue heere in ſimple ſort propoſed and publiſhed to the vewe of the worlde. VVherein I conſider, though the occaſions were diuers, our caſes are not vnlike. Pythagoras likewiſe that greate Philoſopher, for the ſingular ioye conceiued of the inuention of that excellent Theoreme of Rectangle Triangles, made a ſolemne ſacrifice, offering therein an Oxe vnto the Muſes, as teſtifieth Vitruuius the aucthour alſo of the former example. So that wee ſee theſe men, and ſundrie others, that are mentioned in aucthours, beyng caried and ouercome with the incredible delight conceiued of their owne deuiſes and inuentions, though they followe partly the peculiar contentation of their priuate fancies, yet they ſeeme cheefly to reſpect either the glory of GOD, or the furtheraunce of ſome publike commoditie. VVhoſe good exam-*

ple in this behalfe J will endeuour to followe, when to reache their rare giftes otherwiſe, is rather to bee wiſhed then hoped for. And ſeeyng it hath pleaſed GOD to make me the inſtrument to open this noble Secrete, that his name might bee glorified, and the commoditie of my Countrey procured thereby, J thought it my duetie to aduenture my credite, and make my name the Obiecte of ſclaunderous and carpyng tongues, rather then ſuche a Secret ſhould be cõcealed, and the vſe thereof vnknowen. How beneficiall the Art and exerciſe of Nauigation is to this Realme, there is no man ſo ſimple but ſees, by meanes whereof we beeyng ſecluded and diuided from the reſt of the worlde, are notwithſtandyng as it were Citizens of the worlde, walking through euery corner, and round about the ſame, and enioiyng all the commodities of the worlde. How neceſſarie the perfecte knowledge of the Needle or Compaſſe is, to the perfection of the art of Nauigation, your ſelf who haue long tyme verie induſtriouſly trauelled therein, and thereby in it, and other Sea cauſes excell others, can beſt iudge. To attaine vnto this perfection, & to frame as it were a Theorik with Hypothe-

ſes , and rules for the ſaluyng of the apparant irregularitie of the Variation, if it bee a thyng poſsible, or within the compaſſe of mannes capacitie, it muſt doubtleſſe bee doen by due obſeruation of this newe Declinyng propertie, with the Variation cauſed by the admirable efficacie of the Magnes ſtone. VVherefore to further the noble ſtudie of Nauigation and Hydrographie, and to giue occaſion to induſtrious and ſkilfull trauailers by ſea and by lande, to make diligent obſeruatiō of theſe effectes in ſundrie places, wherby ſome generall concluſion maie bee inferred, J haue heere ſet downe whatſoeuer J could finde by exacte triall, and perfect experimentes , and beſides this newe propertie, diuerſe other rare effectes that followe this Philoſophicall Stone. VVherein although J maie ſeem to haue diſcouered my nakedneſſe, and want of Eloquence and orderly Methode to vtter my conceites withall, J truſt the reader will either of his curteſie take all thynges for good that is well meante, or of his grauitie not regardyng the wordes but the matter, diſſemble my faultes, & accept of my paines. And whereas amongeſt diuers learned and expert men in the Mathematicall ſciences, to whō

I haue imparted this ſecrete, I haue firſt of all and chiefly from tyme to tyme ſhewed the maner of it to your worſhip, whiche firſt gaue occaſion that I fell into the conſideration thereof, and through whoſe encouragement I entred into farther examination of the matter, whiche otherwiſe I had neglected. If my trauell herein take ſuche effect, that others be benefited or pleaſured thereby, I haue my deſire, & they are to be thākfull vnto you for the ſame, for I muſt needes aſcribe the occaſion to your good counſaile. To you therefore as to the moſte worthie and beſt acquainted with the cauſe, I preſent the firſte ſight of this my rude & ſimple draught, whiche I truſt, accordyng to your accuſtomed courteſie and frendly affection towardes me, you will take in as good part, as it proceedes from a hartie good will towardes you, whom I praie GOD long to preſerue with al encreaſe of worſhip to his good pleaſure.

Your worſhips moſte humble Robert Norman.

To the Reader.

Many and diuers auncient aucthours, Philoſophers and others, haue written of the *Magnes* or *Lodeſtone*, as alſo of his ſubſtaunce, vertue, and operation, and therevpon ſettyng downe their opinions and iudgementes, haue left the ſame as infallible truthes for them that ſhould ſucceede. And as I maye not, nor meane not herein willyngly to condemne the learned or auncient writers, that haue with greate diligence laboured to diſcouer the ſecretes of Nature in ſundrie thynges, with their operations and cauſes, yet I meane God willyng, without derogatyng frō them, or exaltyng my ſelf, to ſet doune a late experimented truth found in this Stone, contrary to the opinions of all thē that haue heretofore written thereof. Wherein I meane not to vſe barely tedious coniectures or imaginations, but briefly as I maie to paſſe it ouer, foundyng my argumentes onely vpon experience, reaſon, and demonſtratiō, whiche are the groundes of Artes. And albeit it maie bee ſaied by the learned in the Mathematicalls, as hath been alreadie written by ſome, that this is no queſtion or matter for a Mechanicia̅ or Mariner to meddle with, no more then is the finding of the longitude, for that it muſt bee handeled exquiſitely by Geometricall demonſtration, and Arithmeticall Calculation, in whiche Artes they would haue all Mechanicians and Seamen to bee ignoraunt, or at leaſt inſufficiently furniſhed to performe ſuche a matter, alledgyng againſt them the Latine Prouerbe of *Apelles, Ne ſutor vltra crepidam.* But I doe verely thinke, that notwithſtandyng the learned in thoſe ſciences beeyng in their ſtudies amongeſt their bookes, can imagine greate matters, and ſette doune their farfetcht conceiptes in faire ſhewe, and with plauſible woordes, wiſhyng that all Mechanicians, were ſuche as for want of vtteraunce ſhould bee forced to deliuer vnto them their knowledge and co̅ceiptes, that they might floriſhe vpon them, and applie the̅ at their pleaſures: yet there are in this lande diuers Mechanicians, that in their ſeuerall faculties and profeſſions, haue the vſe of thoſe artes at their fingers endes, and can applie them to their ſeuerall purpoſes, as effectually and more redily, then thoſe that would moſte condemne them. For albeeit thei haue not the vſe of the Greeke and Latine tongues, to ſearche the varietie of Aucthours in thoſe artes, yet haue they in Engliſhe for Geometrie *Euclides* Elementes with abſolute Demonſtrations: and for Arithmeticke *Recordes* woorkes, bothe his firſt and ſeconde cond part:and diuers others,bothe in Engliſhe and in other Vulgar languages , that haue alſo written of them , whiche bookes are ſufficient to the induſtrious Mechanician,to make hym perfecte and ready in thoſe Sciences,but eſpecially to applie the ſame to the Arte or facultie whiche he cheefly profeſſeth . And therefore I would wiſhe the learned to vſe modeſtie in publiſhyng their conceites,and not diſdainfully to condemne men that will ſearch out the ſecretes of their Artes and Profeſſions, and publiſhe the ſame to the behoofe and vſe of others , no more then they would that others ſhould iudge of them,for promiſyng muche and performyng little or nothyng at all . *Ariſtotle* ſaieth,that euery man is beſt to bee beleeued in his owne profeſſed Arte and Science. Nowe (courteous Reader) I am to requeſt thee to accepte of this my diſcourſe , wherein I haue taken ſome paines,as the trauell it ſelf maie teſtifie: and been at ſome charge alſo my ſelf, for the more carefull and orderly handelyng of ſuche matters as are neceſſarilie incident to this preſent treatiſe : All whiche I haue been content to doe,that the worke , though it bee not bigge, yet effectuall,by the common vſe thereof maye yeelde profite accordynglie , to them ſpeciallie that are of capacitie to comprehende this newe reuealed ſecrete. To conclude,the cheefeſt and onely marke whereat I laye leuell,was the benefiting of my Countriemen,in whom I wiſhe cõtinuall increaſe of knowledge and cunnyng, as in all other commendable profeſſions, ſo cheefly in thoſe that are moſte neceſſarie and profitable. Thus bequeathyng my trauaile heerein to thy diſcrete conſtruction, and wiſſhing thy furtherance in this moſte neceſſarie and profitable knowledge, I leaue thee to the direction of Gods holie Spirite.

Farewell.

R. N.

The Magnes or Lodeſtones challenge.

Giue place ye glitteryng ſparkes,
ye glimmeryng Saphires bright,
Ye Rubies redde, and Diamonds braue,
wherein ye moſte delight.

In breeſe, ye ſtones inricht,
and burniſht all with golde,
Set forthe in Lapidaries ſhoppes,
for Iewells to bee ſolde.

Giue place, giue place I ſaie,
your beautie, gleame, and glee,
Is all the vertue for the whiche,
accepted ſo you bee.

Magnes, the Lodeſtone I,
your painted ſheathes defie,
VVithout my helpe in Indian ſeas,
the beſte of you might lie.

I guide the Pilots courſe,
his helpyng hande I am,
The Mariner delights in me,
ſo doeth the Marchaunt man.

My vertue lyes vnknowne,
my ſecretes hidden are,
By me the Court and Common weale,
are pleaſured verie farre.

No Shippe could ſaile on Seas,
her courſe to runne aright,
Nor Compaſſe ſhewe the readie waie,
were Magnes not of might.

Bluſhe then, and blemiſhe all,
Bequeath to me thats dewe,
Your ſeates in golde, your price in plate,
whiche Iewellers doe renewe.

Its I, its I alone,
whom you vſurpe vpon,
Magnes by name, the Lodeſtone cald,
the prince of Stones alone.

If this you can denie,
then ſeeme to make replie,
And let the painfull Seaman iudge,
the whiche of vs doeth lie.

The Mariners iudgement.

THe Loadſtone is the Stone,
the onely Stone alone,
Deſeruyng praiſe aboue the reſt,
whoſe vertues are vnknowne.

The Marchantes verdict.

THe Saphires bright, the Diamōds braue,
are ſtones that beare the name,
But flatter not, and tell the troth,
Magnes deſerues the fame.

¶ *The firſt Chapter.*

¶ *Of the* Magnes *or* Lodeſtone, *where thei are founde, and of their colours, weight, and vertue in drawyng Iron, or Steele: and of other properties of the ſame ſtone.*

THe Magnes or Lodeſtone is found in diuers partes of the worlde, and moſte commonly in Iron Mines, and although it be ponderous and weightie, yet it is not founde to be of the Iron Ewre, neither containeth in it any mettall of it ſelf, but hath a certaine affinitie vnto Iron or Steele. It was called Magnes, becauſe the firſt finder thereof was ſo named, who (as Plinie writeth) was an Herdſman in Eaſt India.

This Stone (as writeth Cardinall Cuſan) hath ſubſtance, vertue, and operation. His vertue is conſerued and nouriſhed of his ſubſtance: and of this vertue proceedeth diuers ſtrange effectes and operations, ſeruyng to many good purpoſes, as ſpecially to the art of Nauigation, without whiche there could haue been no diſcoueries by Sea, nor the partes of the worlde made knowne and frequented, as now they are. And therefore the vertue of this Stone of all others, maie be accompted the moſte precious.

Of theſe are diuers ſortes different eche from other, as well in goodneſſe, as in colour, weight, and force, but not in propertie (although many haue iudged the variation of the Needle, to bee accordyng to the diſtance of the Mine where the Stone was bred, to the place where he is vſed.)

The firſt and beſt ſorte of theſe Stones come out of Eaſt India, from the coaſt of China, and Bengalia, and is of the colour of Iron, or ſanguine colour: theſe ſtones are verie maſſiue and weightie, and will drawe or lift vp the iuſt weight of hym ſelf in Iron or Steele (if the Stone exceede not a pound weight.) And theſe are of the fineſt ſort, and are ſold commonly for their proper weight in Siluer, in the Eaſt India where they growe, becauſe the beſt and fineſt are verie rare to bee founde. For it is commonly a ſole Stone, liyng by hym ſelf in the earth, and no ſhell or peece of an other.

There is an other ſorte of a reddiſh colour founde in Arabia and the Red Sea, growyng broad and flatte, muche like to a Tileſtone or Slate: this is not ſo weightie as thoſe of China, but it is verie nere as good, and the vertue contineweth long on the Compaſſe or Needle that is touched with it.

There is likewiſe of theſe Stones in Leuant, in the Ile of Elba, hard by a towne in the ſame Ilande called Porto Feraro, from whence our Mariners daily bryng of them, and are called there Calamita Preta, that is to ſaie The blacke Magnes, becauſe there is an other ſort that is white and light, like vnto a peece of drie Fullers claie, and is called Calamita Blanca.

This Calamita Blanca is founde alwaies with the other, ſtickyng faſt in the outſide thereof, like claie. And this white is forbidden to bee vſed in that countrey, becauſe euill women there, doe applie it to deſtroy conception, whereof this Stone is a greate enemie. Other thinges are noted of this white Calamita for obtainyng of wanton purpoſes, which I thinke not credible, and therefore will omit it. Theſe blacke Stones of Elba are myngled with white vaines, thei are of no greate force, nor their vertue of long contineweance.

Alſo there are of theſe Stones in high Almanie, that are full of holes like a Honie combe, and lighter then the other, but yet verie good, and theſe are of Iron colour.

An other ſorte there is in Norwaie, in the Iron Mines, as in Longſounde, and other places, their colour is black, mixed or as it were enterlarded with graie, theſe are of the ſmalleſt force of any that are founde.

I haue ſeen alſo in the Mines of Carauaca in Spaine of a graie colour, but of no great force: theſe are cōmonly brought by horſe doune to Siuill and Caliz to bee ſold, and oftentymes to Valentia, Alicante, and Lisbone.

All theſe Stones are different one from an other, as well in force, as in colour and weight: yet al of one operation in the Needle, ſhewyng one poincte Attractiue, as I haue proued my ſelf by three ſundrie ſortes of them, whiche I haue: and all drawyng Iron to them. Yet the Philoſopher Auerroes writeth, that the Magnes draweth not Iron vnto it, but the Iron of his naturall inclination mooueth to the Stone.

And though this poſition maie ſeeme to cary ſome truth with it, by the bare vewe of the ſight, when the Iron is lighter then the Stone: yet contrariwiſe you ſhall finde, that the Stone will moue to the Iron, if the Stone bee good, and the Iron of greater weight then the Stone (ſo that the weight of the Stone exceed not his Attractiue ſtrength.)

Neuertheleſſe, we maie not thereby take awaie the vitall or liuely ſpirite from the Stone, and attribute it vnto the Iron: for in ſo doyng we ſhould doe Nature greate wrong. For it is apparant, that the Iron hath no Attractiue vertue, nor power of it ſelf, vntill it hath receiued it of the Stone. But Iron hauyng a certaine affinitie, or naturall qualitie agreable to the Stone, doeth aptly and freely receiue his vertue, and as ſubiecte, ſuffereth this vitall ſpirite of the Stone to impreſſe, and reſt quietly in his maſſiue and ſolide bodie, whiche when it hath receiued by touchyng the Stone, it is endewed with the verie ſame propertie and operation in all reſpects (though not in ſo greate force) as the Stone it ſelf.

For as the Stone hath power, to ſhewe the Attractiue poinct, ſo hath the touched Iron. As the Stone hath two principall poinctes, ſo hath the Iron. And likewiſe, as the Stone hath power to drawe Iron to it, ſo will the Iron ſo touched drawe an other Iron to it, and imparte all theſe vertues to an other Iron in qualitie, though not in quantitie: and thus in all reſpectes, it conteineth in it, the very propertie of the ſtone.

Paracelſus writyng of the augmentyng of the ſtrength of the Magnes Stone ſaieth, that if this Stone bee laied in the fire, vntill it bee almoſte redde hoate, and then taken out, and quenched in the Oile of Crocus Martis, it will ſo augment and multiplie his force, that it will pull a Naile out of a wall. But I ſuppoſe he ment not that the Naile ſhould bee faſt, for then it were a miraculous matter.

Others haue written, that in thoſe partes, where the Magnes graweth in the ſea, it is of ſuche force, that if any Shippes that haue Iron in them paſſe by, or ouer them, that thei are preſently either ſtaied, or drawen downe to the bottome, by reaſon of the Iron. Not theſe onely, but many other Fables haue been written by thoſe of auncient tyme, that haue as it were ſet downe their owne imaginations for vndoubted truthes, and this moſte of all in Geographie, and Hydrographie, or Nauigation Therefore I wiſhe experience to bee the leader of Writers in thoſe artes, and reaſon their rule in ſettyng it downe, that the followers bee not ledde by them into errours, as oftentymes it is ſeen.

True it is, that God is mightie and meruailous in all his workes: yet he doeth not allowe vs to ſaie more then truth of them. And truly, his power is as greatly ſhewed in the Magnes, as in any ſtone that he hath created: and who ſo ſhall goe about curiouſly to ſeeke out the efficient cauſe of his properties, I ſuppoſe the longer he ſeeketh, the more he ſhall meruaill, and yet neuer the neerer his purpoſe.

The vertue of this ſtone is diſtributiue, as many other vertues are, muche comparable vnto Muſke, that hauyng a ſweete ſauour or ſmell it ſelf, imparteth the ſame to an other thing, as to a paire of gloues, & thoſe gloues giue out ſauour, and parfume a whole cheſt of Clothes: Euen ſo the Iron that hath receiued this vertue of the Stone, will extende, and giue that ſame to an other, & that Iron to an other, and ſo to many.

And in this poinct the ſtone is meruailous, that notwithſtanding you touche ten thouſande Irons or nailes with him, euery one of thẽ caryng awaie as muche vertue as will lifte vp an other his like (ſo thei excéede not the weight of a ſixe peny nayle) yet the ſtone it ſelf wilbe nothyng diminiſhed of his ſtrength, but continue of one force.

If I ſhould ſaie here, that by the Attractiue ſtrength of a ſmall Magnes of two or thrée pounde weight, I could lift vp, or cauſe to hang by the vertue thereof, a thouſande pounde of Iron at one inſtant, peraduenture you would bee doubtfull of the ſucceſſe. Neuertheleſſe by experience in all things, wherein conſiſteth truth and reaſon, of neceſſitie reaſon muſt yeeld, when truth is preſent. And therefore, becauſe you ſhall not remaine doubtfull herein, thus you may doe it, and onely make proofe by two or thrée nayles if you will: for the ſame ſucceſſe that you haue in them you ſhall haue in all the reſt.

Take a common boordnaile, & touch the head of him with the North parte of the Magnes or Lodeſtone, then take the ſame naile, and beate it with a peece of wood lightly into ſome poſt or tymber vpwardes, ſo as the head maie hang downewards, (but not with Iron, becauſe the Iron will take away ſome parte of the vertue from the naile:) this done, take an other nayle, and touche the head thereof with the South part of the Stone, and then if you put the head of it to the head of the firſt naile, it will hang faſt by it a whole yeare or more. And after this maner you may, if you will take the paines, hang a hundred tunne of Iron with the vertue of this little Stone, and yet the Stone nothing diminiſhed of his force. But it is neceſſarie in proofe of this matter, that you haue a very good Stone.

Furthermore, concernyng the other properties of this Stone, if you put it in a drie Diſhe, and ſette it to ſwim in a tub of water, it will turne the Diſh about, and the North part of the Stone after many ſwaruinges to and fro, will reſt, and directly ſhewe the line of Variation, or imagined Attractiue poinct.

Alſo, if you hang this Stone by a thred, that it may eaſely moue, it will ſhewe the like effect as on the water. And if you haue two Stones, putting the two South partes of them together, the one will flee and turne away from the other, and likewiſe of the North poincts.

And farther ye ſhall note well this as a ſpeciall poinct, the North poinct of the Stone touchyng a needle, or the wiers of a compaſſe, will make the ſame poinct touched to ſhewe the South: and contrariwiſe, keepyng touched with the South poinct, will make the ſame to ſhew the North. So as alwaies that parte of the Stone that aunſwereth to the North of the needle, is properly the South part of the Stone.

The ſecond Chapter.

Of the diuers opinions of thoſe that haue written of the Attractiue *poinct, and where they haue imagined it to be.*

THE ſubtill properties and hid ſecretes of nature in the Magnes, as alſo in diuers other thinges, hath ſo troubled the wittes of the ſerchers thereof, that alwaies, when they came to the vpſhot, wantyng experience, and thereby reaſons finger to ſhew them a direct mark, they were conſtrayned to ſeeke or imagine a marke, where in deede none at all was, and thus ſhootyng as it were in the ayre, euery man where he thought beſt, thei haue al ſhot wide, and none touched the marke. The marke I meane here is the poinct Attractiue, or rather, as ſhalbe ſaied hereafter more at large, the poinct Reſpectiue.

This poinct, anciently called the Attractiue poinct, hath bin by ſome imagined to bee in the moouyng ſpheres diſtant from the poles of the worlde: whiche opinion Martin Curtes in his booke of Nauigation refutyng, ſaieth, that if it were ſo, then the ſame poinct beyng caried about the pole by their violent motion, would cauſe the needle or compaſſe touched with the vertue of the Stone, to varie daiely in euery place, accordyng to the diurinall motion of the ſame ſphere. But in confutyng that erroneous opinion, he hath (as it appeareth) fallen into as greate an errour hymſelf: imaginyng the poinct Attractiue, to be beyond the poles of the worlde, without all the moueable heauens. Which poinct (ſaieth he) hath power by Attraction, to drawe Iron to it, that is touched with the Lodeſtone. This errour I referre to bee diſcuſſed in the ſixt Chapter.

Others haue thought this poinct to bee in the earth, nere the North pole, imagining in that parte to bee ſome greate Rocks of the Lodeſtone, and that by their Attraction the cōpaſſe or needle is cauſed to Reſpect or ſhew that part.

This opinion of all the reſt is eaſieſt to be confuted by daily experience: for if the compaſſe or needle were drawen towardes the North parte, by any Attraction of the Magnes ſtones in thoſe parts imagined, why then ſhould not the compaſſe or needle ſhew the ſame effect in mouyng towardes the Iland of Elba in the Leuant Seas, where are greate quantities of theſe Stones? and yet the ſhips ſailing within a myle of this Ilande, yea and into Porto Feraro a Towne of the ſame Ile, within a quarter of a myle of a huge Rocke of theſe Stones, the compaſſe or needle is not found any thyng to be drawen or changed, nor the Attraction of this huge Rocke to extende ſo farre as one quarter of a myle. And as I haue ſayd by this, ſo may I ſay by diuers other places, where the Lodeſtones are found, in Cliftes and Mines nere to the ſea ſide, as in Norway and other places.

Pedro de Medina in his booke of Nauigation is of the opinion of Martin Curtes as touchyng the Attractiue poinct: but he doeth not allow of the variation of the cōpas or needle, but ſaieth, that if the compas or needle ſhewe not the pole, the fault is in placyng the wiers on the flye, and not in any propertie it hath to varie.

Theſe opinions be diuers, but the cheefeſt cauſe why they haue gone ſo farr wide, from the Attractiue poinct, as I haue aboue ſaied, was becauſe thei wanted reaſons finger to ſhew them towardes the direct marke. By this reaſons finger, I meane a certain Declinyng propertie vnder the Horizon lately founde in the needle, whiche I will entreate of at large.

¶ The third Chapter.

¶ By what meanes the rare and ſtraunge Declining *of the needle, from the plaine of the Horizon was firſt founde.*

Hauyng made many and diuers compaſſes, and vſing alwaies to finiſh and ende thē, before I touched the needle, I found continually, that after I had touched the Irons with the Stone, that preſently the North poinct thereof would bende or Decline downwardes vnder the Horizon in ſome quantitie: in ſo much that to the Flye of the Cōpaſſe, whiche before was made equall, I was ſtil conſtrained to put ſome ſmall peece of Waxe in the South part thereof, to counterpoiſe this Declining, and to make it equall againe.

Whiche effect hauyng many tymes paſſed my handes, without any great regard thervnto, as ignorant of any ſuche propertie in the Stone, and not before hauyng heard nor read of any ſuche matter: It chaūced at length that there came to my handes an Inſtrument to be made, with a needle of ſixe ynches long, whiche needle after I had polliſhed, cut of a iuſt length, and made to ſtand leuell vpon the pin, ſo that nothyng reſted but onely the touchyng of it with the Stone: when I had touched the ſame, preſently the North parte thereof Declined downe, in ſuche ſorte, that beeyng conſtrayned to cut awaie ſome of that parte, to make it equall againe, in the ende I cut it too ſhort, and ſo ſpoyled the needle wherein I had taken ſo muche paines.

Hereby beyng ſtroken into ſome choler, I applied my ſelf to ſeeke further into this effect, and makyng certaine learned and expert men, my freendes, acquainted in this matter, they aduiſed me to frame ſome Inſtrument, to make ſome exacte triall, how muche the Needle touched with the Stone would Decline, or what greateſt Angle it would make with the plaine of the Horizon. Whereupon I made diligent proofes, the maner whereof is ſhewed in the Chapter followyng.

¶The fourth Chapter.

¶How to finde the greateſt Declinyng of the Needle vnder the Horizon.

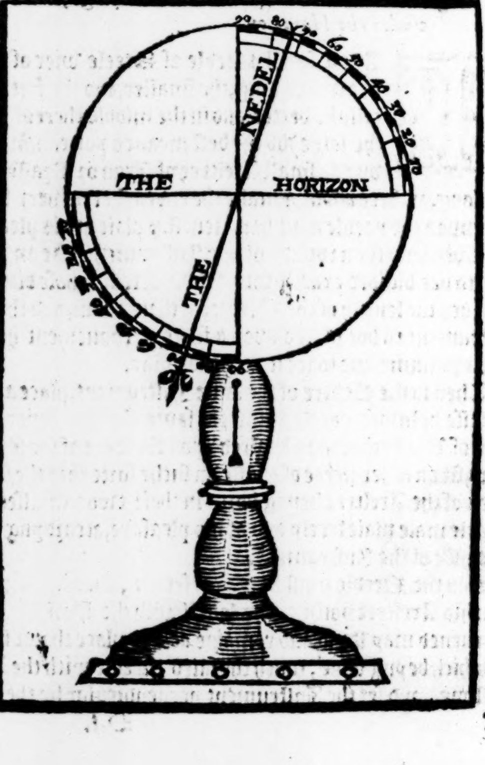
TAke a ſmall Needle of Steele wier of fiue or ſixe inches long, the ſmaller, and the finer mettall, the better: and in the middle thereof (croſſe the ſame) by the beſt meanes you can, fixe as it were a ſmall Axeltree of Iron or Braſſe of an inch long, or there about, & make the endes thereof very ſharpe wherupon the needle maie hang leuell, & plaie at his pleaſure.

Then prouide a rounde plaine Inſtrument, like an Aſtrolabe, to bee diuided exactly into 160. partes, whoſe diameter muſt bee the length of the Needle, or there about, and the ſame Inſtrument to bee placed vpon a foote of conuenient heigth, with a plumme line to ſet it perpendicular.

Then in the Centre of the ſame Inſtrument, place a peece of glaſſe holowed, and againſt the ſame Centre, vpon ſome plate of Braſſe that may be fixed vpon the foote of the Inſtrument, ſit an other peece of glaſſe, in ſuche ſorte that the ſharpe endes of the Axeltree beyng borne in theſe twoo Glaſſes, the Needle maie plaie freely and at his pleaſure, accordyng to the ſtandyng of the Inſtrument.

And the Needle muſt bee ſo perfected, that it maie hang vpon his Axeltree bothe endes leuell with the Horizon, or beyng turned may ſtand and remaine at any place that it ſhalbe ſet: which beyng done, touch the ſaied Needle with the Magnes ſtone, and ſet the Inſtrument perpendicular by the plum line, and turne the edge of the inſtrument South and North, ſo as the Needle maie ſtand duely according to the Variation of the place: which Variation the Needle of his owne propertie would ſhewe, were it not that he is conſtrained to the contrarie by the Axeltree.

Then ſhal you ſee the Declination of the North poinct of the touched Néedle, whiche for this citie of London, I finde by exact obſeruatiōs to be about 71. degrées 50. mi. The forme of the Inſtrument here deſcribed, with the maner of the declination, I haue here placed that it maie be the eaſier cōceiued.



¶ The fift Chapter.

¶ *That in the vertue of the* Magnes *or* Lodeſtone, *is no ponderous or weightie matter, to cauſe any ſuche* Declining *in the Nedle.*

Becauſe the opinions of men are diuers, and the argumentes of many againſte reaſon, peraduenture there are ſome will ſaie, that I am deceiued euen in the grounde and cheefeſt poincte of this my purpoſe, alledgyng (as ſome haue already doen without reaſon) that this Declinyng of the Needle, is cauſed by ſome ponderous ſubſtance that it receiueth from the Stone, and not (as I take it) to proceede of the ſimple vertue, and ſecrete influence thereof, becauſe the Stone it ſelf, wherein the vertue remaineth and is nouriſhed, is weightie.

I iudge the learned will not allowe a Spirite to haue any corporall ſubſtance or weight, or that it maie ſenſiblie bee felt: if any ſhould, yet by twoo concluſions it is eaſely proued, that the vertue of this Stone conteineth in it no weightie matter: and thus founde.

Take three or foure ſmall peeces of Iron or Steele wier, and puttyng them in a fine gold Ballance, counterpeiſe them iuſtly with Leade: Then take them out, and touche them well with the Stone, that they maie receiue the vertue thereof: And after weye them againe in the ſame Ballance, with the ſame Leade, and you ſhall finde them to weie no more, then before they were touched, though euery one of them haue receiued vertue ſufficient to lift vp his fellowe.

Secondly, if the North poinct of the Needle doe Decline by any ponderous or weightie matter, in the vertue receiued by touchyng the Stone, why then ſhould not the South poinct of the Needle, beeyng touched with the contrary ende of the

Stone, haue the ſame Declinyng Southwardes, keepyng all one Stone, and one vertue? Or why doeth not this ſuppoſed heauier ende, fall perpendicularly to the Centre, as by reaſon it ſhould, and not couette a certaine ſituation beſide it, ballancyng it ſelf vp and downe, till it haue founde the ſame? Theſe argumentes maie anſwere this matter. For touche the Needle with what part of the Stone you liſt, that ende of the Needle that ſheweth the North will alwaies Decline.

¶The *ſixt* Chapter.

¶ *A confutation of the common receiued opinion of the poinct* Attractiue.

SEyng it is manifeſt, that there is a Declining in the Needle, & that the ſame is not cauſed by any ponderous or weightie matter in the vertue receiued from the Stone: it maie bee demaunded, by what meanes this Declinyng, or Eleuatyng happeneth, and in whiche of the twoo poinctes conſiſteth the action or cauſe thereof.

Peraduenture you will ſaie (as others haue imagined) that it is in the Southe poincte of the Needle, eleuated by the Attractiue vertue of ſome poincte of the Heauen that waie. Perchance you will yeeld it rather to bee in the North poinct of the Needle, whiche by ſome Attractiue poinct in the earth, or in the Heauens, beyonde the Earth that waie, is drawen downe, and cauſed to Decline, and it Declinyng, of neceſſitie the other South poinct oppoſite muſt needes bee lifted vp.

Your reaſon towardes the earth carieth ſome probabilitie, but if I proue that there be no Attractiue, or drawing propertie in neither of thoſe twoo partes, then is the Attractiue poinct loſt, and falſly called the poinct Attractiue, as ſhall be proued. But becauſe there is a certaine poinct, that the Neeble alwaies Reſpecteth or ſheweth, beyng voyd and without any Attractiue propertie, in my iudgement this point ought rather to be called the point Reſpectiue.

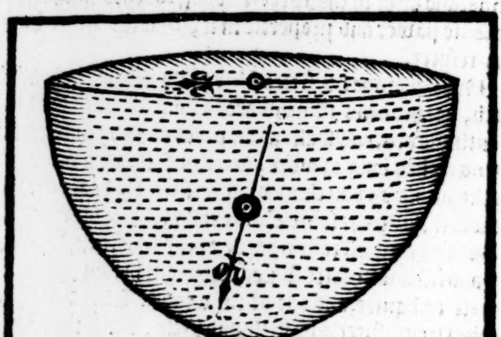
And further, if it may be proued, that there is no Attractiue or drawyng propertie in that poinct, the power and action in that poinct condemned, then of neceſſitie the power and propertie, without any externall cauſe, remaineth onely in the Stone, and after in the Needle beyng touched with it, hauing the ſame power and propertie in it, that the Stone hath in euery reſpect.

Now to proue no Attractiue point neither beneath in the earth, nor heauens Northwardes, nor aboue in the heauens Southwardes, you ſhall take a peece of Iron or Steele wier of two inches long or more, and thruſt it into a peece of cloſe Corke, as big as you think maie ſufficiently beare the wier on the water, ſo as the ſame Corke reſt in the middle of the wier.

Then you ſhall take a deepe glaſſe, bole, cup, or other veſſell, and fill it with faire water, ſettyng it in ſome place, where it maie reſt quiet, and out of the winde. This done, cut the Corke circumſpectly by little and little, vntill the wier with the Corke be ſo fitted, that it maie remaine vnder the ſuperficies of the water two or three inches, bothe endes of the wier lying leuell with the ſuperficies of the water, without aſcendyng or deſcending, like to the beame of a paire of ballance beyng equally poiſed at both endes.

Then take out the ſame wier, without mouing the Cork, and touche it with the Stone, the one ende with the South of the Stone, and the other ende with the North, and then ſet it againe in the water, and you ſhall ſee it preſently turne it ſelf vpon his owne Centre, ſhewyng the aforeſaied Declinyng propertie, without deſcendyng to the bottome, as by reaſon it ſhould, if there were any Attraction downewardes, the lower parte of the water beeyng nerer that poinct, then the ſuperficies thereof.

And as this maie proue no Attraction or drawing downewardes: in like maner, the Corke beyng ſo made, that it maie ſincke very ſlowly to the bottome , and then taken out , and touched with the Stone , and put in againe downe to the bottome with your finger, if any Attractiue drawyng were vpwards,it would aſcende,and come vp to the ſuperficies of the water, beeyng nerer to that poinct then the bottome . But I finde by diligent and exact triall,that it hath no ſuche effect:as in the figure followyng is demonſtrated.



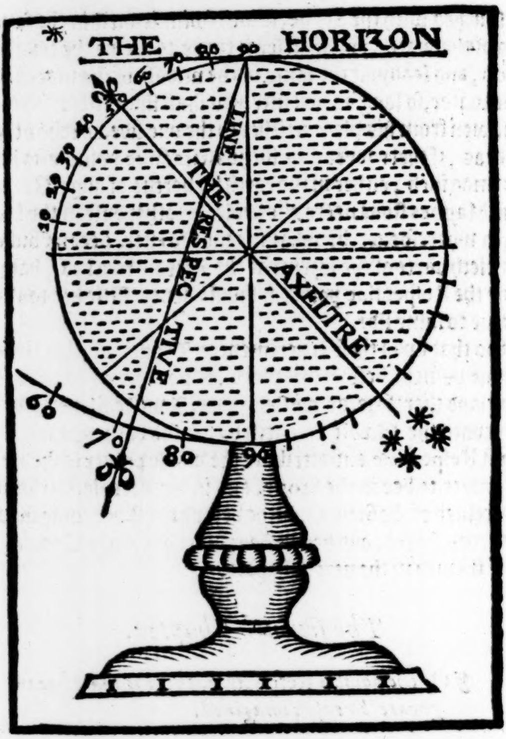
Againe, if you doe fitte your wier with Corke, that after it is touched with the Stone, it will ſwim leauell in the ſuperficies of the water, you ſhall ſee it turne to ſhewe the true Variation, and leauyng the ſame in the middle of the ſuperficies of the water, ſo long as you liſte, you ſhall finde that it will not be drawen from his place, neither to the one ſide, nor the other: whereas, if there were any ſuche Attractiue poincte as hath been imagined, either in the earth by vertue of huge Rockes of the Magnes ſtone neere the Pole, or otherwiſe in the Heauen, or whereſoeuer, by what meanes ſo euer, beeyng but the twentieth parte of the force that the Needle touched, hath to ſhewe the Reſpectiue poinct, it ſhould of neceſſitie bee drawen in tyme to ſome ſide.

So that vpon theſe experimentes I conclude, that the Attractiue poincte before imagined, is no where, nor no ſuche thyng: and therefore, as moſte proper, I will call the poincte, whereunto the Needle inclineth by vertue of the Stone, The poinct Reſpectiue, and attribute the whole power of ſhewyng that poinct, to bee in the Stone, and in the Needle, by the vertue receiued of the Stone, whiche vertue muſt bee imagined to bee turned, borne, and dependyng vpon his owne Centre, as ſhalbe ſhewed in the next Chapter.

The ſeuenth Chapter.

¶ *Of the poincte* Reſpectiue, *where it maie bee by greateſt reaſon imagined.*

This poincte Reſpectiue, is a certaine poincte, whiche the touched Needle doeth alwaies Reſpecte or ſhewe, and is founde by the Declinyng of the Needle, to bee a pricke in ſome one parte of a ſtraight line, Declinyng in this place or Latitude of London vnder the Horizon 71. degrees, and 50. Minutes, as this figure followyng repreſenteth.



This ſtreight line muſt be imagined to proceede from the Centre of the Needle, into the Globe of the earth, extendyng and goyng directly forth bothe waies infinitely. But in what parte of this line the poinct Reſpectiue is, it is not by this bare line alone to bee anſwered, no more then it is poſſible by one bare Angle to meaſure or knowe the diſtance of any place aſſigned.

And for the finding or certaine aſſignyng of the true place of this poincte Reſpectiue, wee muſt leaue, vntill the experte trauailer haue made certaine obſeruation of this Declining of the Needle in other places. For ſeeyng it is certaine, that though in ſeuerall Horizons, the compaſſe hath ſeuerall Variations: yet in any one Horizon, the Needle Reſpecteth alwaies one onely poincte without alteration, as by trauell is truely proued, So I iudge, that in his Declining, it keepeth the like order and certeintie in euery place.

And although the Néedle of the compaſſe, by reaſon of the weight of the heauy flye, can not Decline, as his propertie is, but falſly ſheweth the poinct Reſpectiue alwaies in the Horizon, as moſte neceſſarie ſo to doe for the Nauigation: yet by the meanes and concluſions, which before I haue ſhewed, the diligent trauailer hauyng with hym a good Magnes or Lodeſtone, maie by exact obſeruation, finde the encreaſing or decreaſing of this Declining of the Needle, as his trauell ſhall giue occaſion.

For I am of this opinion, (and that by great reaſon) that this Declining of the Needle ſhall be founde by trauell to bee greate or little, accordyng as the diſtaunce of the poinct Reſpectiue is from the place where the triall is made: which beyng diligently obſerued in ſundrie places, with the certaine Variation of the Needle from the meridian, thereby maie be demonſtrated and founde out the true place of the poinct Reſpectiue.

The eight Chapter.

¶ *Certaine proofes of the power and action wholly and freely beyng in the* Stone *to ſhewe this poinct* Reſpectiue: *and in the Needle, by vertue and power receiued of the* Stone, *and not forced, or conſtrayned, by any* Attraction *in heauen or earth.*

IT is moſte manifeſt in all the workes of Nature, or creatures that GOD hath made, that whatſoeuer qualitie, propertie, or vertue is founde in them, by creation, that is to be holden for their owne. And he that ſhal, by imagination or coniecture, goe about to take theſe their properties from them, and attribute the ſame to any other ſubiect, where vnto they appertaine not, I ſaie that man offendeth God muche, for not beleeuyng his power to be ſufficient in his creatures.

I will not offer to diſpute with the Logicians in ſo many poincts as here they might ſeeme to ouerreache me, in naturall cauſes. But that this Stone hath wholly and fully in him ſelf, power, action, propertie, and vertue of his owne appetite to ſhewe, and to cauſe the Needle to ſhewe the poinct Reſpectiue, without any Attractiue qualitie, or externall cauſe, in Rockes of the Magnes Stone, or by Attraction in the heauens, or els where whatſoeuer, it is alreadie ſufficiently proued.

Notwithſtandyng, if thoſe proofes maie not content, I will at any tyme required herein ſatiſfie the doubtfull by manifeſt experimentes. And therefore where no other cauſe can be probably annexed vnto this Stone, the power and action of neceſſitie is proued in it ſelf.

And by the Declining of the Needle, is alſo proued, that the poincte Reſpectiue is rather in the earth then in the heauens, as ſome haue imagined: and the greateſt reaſon why they ſo thought, as I iudge, was becauſe they neuer were acquainted with this Declining in the Needle, whiche doubtles if Martin Curtes had knowen, he would not haue iudged the Attractiue point to haue bin in the heauens, or without them, but rather in the earth.

Now peraduẽture you will aſke me how this Stone hath his power, and how it is engendred? I am no more able to ſatiſfie you herein, then if you ſhould aſke me how and by what meanes the celeſtiall Spheres are mooued: but that God, in his omnipotent prouidence, hath appoincted it ſo to bee: which maie ſerue for a generall anſwere, to all ſuche curious ſearchers of the ſecrete woorkes of GOD, in his creatures. As though his word alone were not a ſufficient decree, and lawe, to all his woorkes: but bindyng them to ſeconde cauſes, as a thyng of neceſſitie.

These curious ſerchers out of the ſecrets of Nature, further then is requiſite that man ſhould knowe for his neceſſarie vſe, I maie compare to Eſdras, and wiſh them to reade ouer his fourth Booke, and there they ſhall ſee how he was anſwered at Gods handes by his Angell, for his curious queſtions aſked and demaunded.

Now therefore, as I haue before declared, that diuers haue whetted their wittes, *yea* and dulled them, as I haue myne, and yet in the ende haue bin conſtrayned to flee to the corner ſtone, I meane God, who (to conclude) hath giuen vertue and power to this Stone, proper in it ſelf, to ſhew one certaine poinct, by his owne nature and appetite, and not ſubiect to any other accident, in heauen, nor in earth, but freely by his owne proper vertue receiued at his mightie handes in creation: and by the ſame vertue the Needle is turned vppon his owne Centre, I meane the Centre of his Circular and inuiſible vertue, perſing all thinges, and ſtaied by nothing, be it wall, boord, glaſſe, or any thing whatſoeuer.

And ſurely, I am of opinion, that if this vertue could by any means be made viſible to the eye of man, it would be found in a Sphericall forme extendyng rounde about the Stone in great compaſſe, and the dead body of the Stone in the middeſt thereof, whoſe Centre is the Centre of his aforeſaied vertue. And this I haue partly proued and made viſible to be ſeene in ſome maner, and God ſparyng mee life, I will herein make further experience, and that not curiouſly, but in the feare of God as neere as he ſhall giue me grace, and meane to annexe the ſame vnto a booke of Nauigation, which I haue had long in hande.

¶ *The ninth Chapter.*

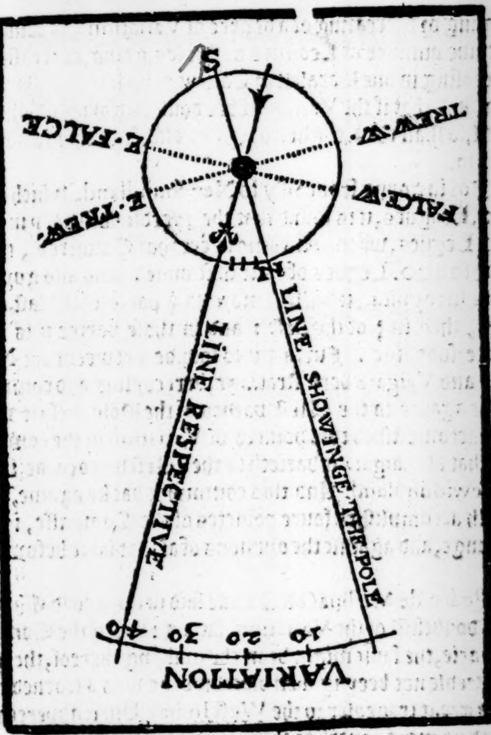
¶ *Of the* Variation *of the Needle, from the pole or Axeltree of the earth, and how it is to be underſtood.*

NOW, as the Needle hath this apparant propertie in Declining under the Horizon, to ſhew the poinct Reſpectiue: So it is moſte manifeſt, that in Declining it hath a propertie in varying, or departing frō the Poles, euen as the poincte Reſpectiue openeth or ſheweth a greter or leſſer diſtance betwixt the ſaied point Reſpectiue, and the Pole or Axeltree of the earth. And this departing is called Variation of the Needle. This is alſo ſhewed in the Needle or wier, in that concluſion of declining in the water, as in the ſixt Chapter, euen by the ſame proportion, that it ſheweth in the Needle Horizontally.

This Variation is no other thing, then a certaine parte or portion of a circle, cōtained betwixt two ſtreight lines proceedyng bothe from one Centre, whiche maie be imagined to be the Centre of the Needle, and from thence both extendyng and goyng directly foorth, one to the Pole or Axeltree of the worlde, and the other to the poinct Reſpectiue: and this parte of circle contayned betwixt theſe twoo lines in the Horizon is ſaied to be Variation.

And further heere is to bee noted, that alwaies theſe two lines haue two right lines, cutting them directly in the Centre of the Needle. The one of them croſſyng the Meridian at right angles in the Centre of the Needle, is the true Eaſt and Weſt of the worlde. And the other croſſyng the line Reſpectiue at right angles, is the falſe Eaſt and Weſt that the varying Needle or Compaſſe ſheweth: all whiche is ſhewed by this preſent figure followyng.

This



This Variation is iudged by diuers trauailers to bee by equall proportion, but herein they are muche deceiued, and therefore it appeareth, that notwithſtanding their trauaile, they haue more followed their bookes then experience in that matter. True it is, that Martin Curtes doeth allowe it to be by proportion, but it is a moſte falſe and erroneous rule. For there is neither proportion nor vniformitie in it, but in ſome places ſwift and ſudden, and in ſome places ſlowe.

It is ſaied to be proportionall or vniforme, when in the encreaſing or decreaſing of a degree of Variation, is founde no certaine number of Leagues or Myles, going, encreaſing, or decreaſing in one Paralell or Latitude, by like equall proportion, and that if the Variation bee doubled goyng by one Paralell, ſo ſhall the Leagues or Miles alſo. But this is not found to be ſo.

For in goyng from Silly to Newfoundland, which is not 600. Leagues, it is found that the Needle doth vary more in 200 Legues, when you come neere that Countrey, then it doeth in 400. Legues of your firſt waie. And alſo goyng to Meta Incognita, it varieth more in $\frac{1}{3}$ parte of the laſt of the way, then in $\frac{2}{3}$ of the firſt: and in thoſe partes it is found to bee ſuddaine. Further it is founde betweene the North cape and Vaigatz very ſtraunge, in recoylyng and commyng backe againe to the Weſtwardes of the Pole, before it hath fully accompliſhed two poinctes of Variation in the compaſſe. So that at Vaigatz it varieth to the Weſtwardes, as it doth at Newfoundland. And this commyng backe againe, before it hath accompliſhed foure poinctes of the Compaſſe, is very ſtraunge, and againſt the opinions of al that haue before written.

Pedro de Medina (as I haue ſaid in the ſecond Chapter) was doubtfull of the Variation, ſaiyng: that if the Compaſſe did varie, the fault might be in the makyng thereof, the wiers or Needle not beeyng well placed: yet he was a learned man, and a great traueyler to the Weſt Indias. But it appereth that he had no more regard to the Variation, then many Mariners in theſe daies.

For in 18. or 20. yeres that I haue trauelled the Seas, beeyng daiely conuerſant with many of them, and diligent in enquiryng of Variation of the places, where I haue not been my ſelf, I could neuer finde twoo of them in one truthe, except for the trauelles from hence Northwardes, and North Eaſtwardes. But I ſuppoſe the greateſt occaſion thereof is by lacke of exact Inſtrumentes for that purpoſe. Wherefore, I haue deuiſed one verie neceſſarie.

And further, becauſe this Variation is diuers, and is foūd ſometymes to the Eaſtwardes, and ſometymes to the Weſtwardes of the Pole, I will declare what the Variation is here in London, by myne owne obſeruation, and in other places, as I haue groſſely gathered of ſome trauellers, reckonyng or beginnyng at the ancient bounde or greate Meridian that paſſeth by the Ile of Saincte Michell in the Aſores, where it is ſaied, that the Needle ſheweth directly the Pole, and the Reſpectiue poincte bothe in one line. But this is not founde to bee ſo.

True it is, that the common Compaſſe ſheweth the Pole verie neere in that Meridian, but the bare Needle ſheweth halfe a poinct, or ſixe degrees to the Eaſtwardes of the Pole. So that you muſt underſtande alwaies the difference betwixt the common Compaſſe, and the Needle, to bee halfe a poincte, and of ſome more: becauſe the greateſt parte of the common ſailyng Compaſſes, hath the Needle ſet in the Flie, halfe a poincte to the Eaſtwardes of the North, and ſome $\frac{1}{4}$ of a poincte, and others at a whole poincte, and ſome againe are ſet directly vnder the Flowre de Lice, or North of the Compaſſe, and theſe are called Meridionall Compaſſes, becauſe they ſhewe directly the Pole in the greate Meridian, as the bare Needle doeth, whiche Meridian muſt needes bee at the leaſt 100, or 120. leagues to the Northwardes of the Ile of Sainct Michell.

And therefore, to write of the Variation of places, by the common reportes of Mariners that haue trauelled Southwardes, and Weſtwardes from hence, it ſhall bee as vncertaine, as are the diuers makynges of theſe common Compaſſes, by whiche they haue made their obſeruations. And therefore I will omit it, and ſpeake onely of this place or Citie of London, whoſe latitude I finde to bee 51. degrees, 32. minutes, and the Variation of the Needle from this Meridian or the Pole to bee 11. degrees, 15. minutes.

And although this Variation of the Needle, bee founde in trauell to bee diuers and changeable, yet at any lande of fixed place aſſigned, it remaineth alwaies one, ſtill permanent, and abidyng. And therefore, I wiſhe the Mariner to make diligent obſeruation of this Variation in diuers places, as he ſhall trauell, by ſome exacte Inſtrumentes for the purpoſe. For it maie bee greatly for his aide, againſt he come there an other tyme, eſpecially in ſuche places, where the Variation is ſwift, as in theſe North partes. And becauſe the common Compaſſe is partaker of this Variation, and declinyng, as the Needle is, I will ſomewhat ſhewe of the ſundrie ſortes and makynges of them, with the inconueniences that maie growe by them, and by ill plattes made by theſe diuers ſortes of Compaſſes.

¶ *The tenth Chapter.*

¶ Of the common Compaſſes, and of the diuers different ſortes and makinges of them, with the inconueniences that maie growe by them, and the plattes made by them.

Of theſe common ſailyng Compaſſes, I finde heere in Europa fiue ſundrie ſortes or ſettes. The firſt is of Leuant made in Sicyle, Genoua, and Venice: and theſe are all for the moſte parte made Meridionally with the wiers directly ſet vnder the South and North of the Compaſſe, and therefore duely ſhewyng the pointe Reſpectiue, in all places as the bare Needle, and by this Compaſſe are the plattes made, for the moſte parte of all the Leuant Seas.

Secondly, there are made in Danſk, in the Sound of Denmark, and in Flanders, that haue the wiers ſet at $\frac{1}{4}$ of a poinct to the Eaſtwardes of the North of the Compaſſe, and alſo ſome at a whole poincte, and by theſe Compaſſes they make bothe the plats and Rutters for the Sound.

Thirdly there hath bin made in this Countrey particularly for Sainct Nicholas and *Ruſſia*, Compaſſes ſet at $\frac{2}{3}$ of a poincte, and the firſt plattes of that diſcouerie were made by this Compaſſe.

Fourthly the Compaſſe made at Siuill, Liſbone, Rochell, Bourdeaux, Roan, and here in England, are moſte commonly ſet at half a poinct, and by this Compaſſe are the platts of the Eaſt and Weſt Indies made for their Pilots, and alſo for our Coſtes neere hereby, as France, Spaine, Portugall, and England: and therefore beſt of theſe Nations to be uſed, becauſe it is the moſt common ſort that is generally in theſe Coaſts. And againe, it is ſaied, that the middle hazard is beſt.

I ſpeake thus, becauſe there are ſo many ſortes of theſe Compaſſes, different eche from other, as before I haue declared. And the Maiſter or Mariner ſailyng by theſe Compaſſes of ſundry ſortes, maie thereby fall into greate perill, and the reaſon is, becauſe that of long time theſe Compaſſes haue bin uſed, and by them the Marine Plattes haue bin deſcribed of ſundrie ſortes, euery one accordyng to the Compaſſe of that Countrey.

If then he take not the Compaſſe of the ſame ſett or makyng that his Plat was made by, then his Carde or Plat will ſhewe him one courſe: and the Compaſſe, when he thinketh he goeth well, will cary hym an other waie. And thus, when he thinketh to fall with the place that his Carde ſheweth him, he ſhall bee as farre wide, as the Compaſſe he hath ſailed by is different from that his Plat was made by.

This is the grounde and cauſe of many inconueniences, whiche is now too late to be generally reformed. Therefore I wiſhe the Mariner to haue a greate regarde unto this, as a principall poincte in Nauigation, and not to ſaile by a Compaſſe of one Pariſhe, and a Plat of an other: I meane, that they haue a reſpecte, as nere as thei may, to ſaile by a Compaſſe of that countrey, where his Plat was made.

Yet many there are that uſe our Compaſſe with Leuant Plattes, but I ſuppoſe, without good conſideration therein, they ſhall make but wide reckonynges. And this hath been ſufficiently of late experimented, by our Mariners, that haue vſed Leuant.

Peraduenture there are ſome will ſaie, that he knoweth a good Compaſſe, if he ſee it. I ſaie the Compaſſe maie bee good, and yet not good for hym, except his Plat bee agreable. As for example. A Leuant Compaſſe is a good Compaſſe, to vſe with a Leuant Plat, but it differeth from our Compaſſe halfe a poinct more Eaſterly. And others there are of Danſk, that differ from ours $\frac{1}{2}$ a poinct more Weſterly, and yet beeyng vſed in their kinde, are good Compaſſes.

And therefore I conclude, that generally the beſte Compaſſe is this ſort ſet at $\frac{1}{2}$ a poincte, becauſe the maior parte of Compaſſes and Plattes, doeth not differ from this aboue $\frac{1}{4}$ of a poinct, except the two aboue named of Leuant and Danſk.

I haue heard many ſaie that haue trauailed farre to the Southwardes, that the Compaſſe hath ſeemed to loſe his force, and to waxe weake and dull. I iudge the cauſe is not by reaſon of the farre diſtance from the North Pole, but rather by beeyng long abſent from the Stone, for not beyng touched or refreſhed therewith. And again, the Pinne that beareth the Flie maie bee ſo dulled with long vſyng, that the Flie is as it were ſtaied, that it can not plaie as it would if it were ſharpe.

Therefore, if you make it ſharpe with a Whetſtone, you ſhall finde it remedied: and alſo when you finde it light, or too tickle, you maie dull the poinct of the Pinne, with the leafe of a paire of writyng Tables, vntill you maie ſee the top thereof, and then the Compaſſe will bee better for a high Sea. And thus by ſharping and dullyng of the Pinne, you maie make your Compaſſe fit for all Weathers.

Here after followeth a
Table of the Sunnes Declina-
tion, commonly called a Regiment for
the Sunne, exactly Calculated vnto
the Minute, by the true place of the
Sunne, whoſe greateſt Declination
for this age, is 23. Degrees,
28. Minutes, and maie
ſerue for 30. yeres
without great
errour.

⁂

IANVARIE.

First.				*Second.*				*Thirde.*				*Fourth.*		
D.	G.	M.		D.	G.	M.		D.	G.	M.		D.	G.	M.
1	21	50		1	21	52		1	22	54		1	21	56
2	21	41		2	21	44		2	21	47		2	21	49
3	21	30		3	21	34		3	21	36		3	21	39
4	21	20		4	21	24		4	21	26		4	21	29
5	21	9		5	21	13		5	21	16		5	21	18
6	20	58		6	21	2		6	21	4		6	21	7
7	20	47		7	20	50		7	20	53		7	20	56
8	20	35		8	20	38		8	20	41		8	20	44
9	20	23		9	20	26		9	20	29		9	20	32
10	20	10		10	20	12		10	20	16		10	20	18
11	19	57		11	20	0		11	20	3		11	20	6
12	19	43	*South Declination.*	12	19	46	*South Declination.*	12	19	49	*South Declination.*	12	19	52
13	19	30		13	19	33		13	19	36		13	19	39
14	19	16		14	19	19		14	19	23		14	19	27
15	19	0		15	19	5		15	19	7		15	19	11
16	18	45		16	18	49		16	18	52		16	18	56
17	18	30		17	18	33		17	18	37		17	18	41
18	18	15		18	18	19		18	18	22		18	18	26
19	18	0		19	18	4		19	18	7		19	18	11
20	17	44		20	17	46		20	17	51		20	17	54
21	17	27		21	17	30		21	17	34		21	17	38
22	17	11		22	17	14		22	17	17		22	17	21
23	16	53		23	16	56		23	17	0		23	17	5
24	16	35		24	16	39		24	16	43		24	16	48
25	16	18		25	16	21		25	16	25		25	16	30
26	15	59		26	16	4		26	16	8		26	16	13
27	15	40		27	15	46		27	15	50		27	15	55
28	15	22		28	15	27		28	15	31		28	15	36
29	15	3		29	15	8		29	15	12		29	15	17
30	14	44		23	14	48		30	14	53		30	14	58
31	14	24		31	14	29		31	14	34		31	14	39

FEBRVARIE.

First.				*Second.*				*Thirde.*				*Fourth.*		
D.	G.	M.		D.	G.	M.		D.	G.	M.		D.	G.	M.
1	14	5	*South Declination.*	1	14	10	*South Declination.*	1	14	15	*South Declination.*	1	14	20
2	13	45		2	13	51		2	13	55		2	13	59
3	13	25		3	13	30		3	13	35		3	13	40
4	13	5		4	13	10		4	13	14		4	13	20
5	12	45		5	12	50		5	12	54		5	13	0
6	12	24		6	12	30		6	12	34		6	12	40
7	12	3		7	12	8		7	12	13		7	12	19
8	11	42		8	11	47		8	11	52		8	11	58
9	11	21		9	11	26		9	11	31		9	11	36
10	10	0		10	11	5		10	11	10		10	11	15
11	10	39		11	10	44		11	10	49		11	10	54
12	10	17		12	10	22		12	10	27		12	10	33
13	9	54		13	10	0		13	10	5		13	10	11
14	9	32		14	9	38		14	9	43		14	9	49
15	9	10		15	9	16		15	9	21		15	9	27
16	8	48		16	8	54		16	8	59		16	9	5
17	8	26		17	8	32		17	8	37		17	8	43
18	8	3		18	8	9		18	8	14		18	8	20
19	7	41		19	7	47		19	7	52		19	7	58
20	7	18		20	7	24		20	7	29		20	7	35
21	6	55		21	7	1		21	7	6		21	7	12
22	6	32		22	6	38		22	6	43		22	6	49
23	6	9		23	6	15		23	6	20		23	6	26
24	5	46		24	5	52		24	5	57		24	6	3
25	5	22		25	5	28		25	5	34		25	5	40
26	4	59		26	5	5		26	5	10		26	5	16
27	4	35		27	4	41		27	4	47		27	4	53
28	4	12		28	4	18		28	4	23		28	4	29
												29	4	6

MARCHE.

First.				Second.				Third.				Fourth		
D.	M.	G.		D.	M.	G.		D.	M.	G.		D.	M.	C.
1	3	49	★ South Declination.	1	3	54	★ South Declination.	1	4	0	★ South Declination.	1	3	42
2	3	26		2	3	31		2	3	36		2	3	19
3	3	2		3	3	7		3	3	13		3	2	55
4	2	38		4	2	43		4	2	50		4	2	31
5	2	14		5	2	19		5	2	26		5	2	7
6	1	50		6	1	55		6	2	2		6	1	43
7	1	27		7	1	32		7	1	38		7	1	21
8	1	4		8	1	9		8	7	15		8	0	57
9	0	40		9	0	45		9	0	51		9	0	33
10	0	16		10	0	21		10	0	28		10	0	9
11	0	8	Line.	11	0	2	Line.	11	0	4	Line.	11	0	14
12	0	32	★ North Declination.	12	0	26	★ North Declination.	12	0	20	★ North Declination.	12	0	38
13	0	56		13	0	50		13	0	44		13	1	2
14	1	20		14	1	14		14	1	8		14	1	26
15	1	43		15	1	37		15	1	31		15	1	49
16	2	6		16	2	0		16	1	54		16	2	13
17	2	30		17	2	24		17	2	17		17	2	36
18	2	53		18	2	47		18	2	41		18	2	59
19	3	17		19	3	11		19	3	5		19	3	23
20	3	39		20	3	34		20	3	29		20	3	46
21	4	3		21	3	57		21	3	51		21	4	10
22	4	25		22	4	20		22	4	15		22	4	32
23	4	49		23	4	43		23	4	37		23	4	56
24	5	12		24	5	7		24	5	1		24	5	18
25	5	36		25	5	30		25	5	24		25	5	42
26	5	57		26	5	53		26	5	48		26	6	4
27	6	20		27	6	16		27	6	10		27	6	27
28	6	43		28	6	38		28	6	33		28	6	49
29	7	6		29	7	1		29	6	55		29	7	12
30	7	29		30	7	24		30	7	18		30	7	34
31	7	51		31	7	46		31	7	41		31	7	57

APRILL.

First.				*Second.*				*Third.*				*Fourth.*		
D.	G.	M.		D.	G.	M.		D.	G.	M.		D.	G.	M.
1	8	12	*North Declination.*	1	8	8	*North Declination.*	1	8	2	*North Declination.*	1	8	18
2	8	35		2	8	30		2	8	24		2	8	41
3	8	57		3	8	52		3	8	46		3	9	3
4	8	18		4	9	13		4	9	8		4	9	24
5	9	41		5	9	35		5	9	29		5	9	45
6	10	1		6	9	56		6	9	50		6	10	7
7	10	23		7	10	18		7	10	12		7	10	29
8	10	45		8	10	39		8	10	34		8	10	50
9	11	5		9	11	0		9	10	55		9	11	10
10	11	26		10	11	20		10	11	15		10	11	31
11	11	46		11	11	41		11	11	36		11	11	51
12	12	6		12	12	2		12	11	56		12	12	11
13	12	27		13	12	22		13	12	16		13	12	32
14	12	46		14	12	42		14	12	36		14	12	51
15	13	5		15	13	1		15	12	55		15	13	10
16	13	25		16	13	20		16	13	15		16	13	29
17	13	45		17	13	40		17	13	35		17	13	49
18	14	4		18	13	59		18	13	54		18	14	8
19	14	22		19	14	18		19	14	14		19	14	26
20	14	40		20	14	36		20	14	32		20	14	45
21	14	59		21	14	55		21	14	51		21	15	4
22	15	18		22	15	13		22	15	9		22	15	22
23	15	35		23	15	31		23	15	27		23	15	39
24	15	53		24	15	49		24	15	45		24	15	57
25	16	11		25	16	7		25	16	2		25	16	15
26	16	27		26	16	23		26	16	20		26	16	31
27	16	45		27	16	41		27	16	36		27	16	48
28	17	1		28	16	56		28	16	53		28	17	5
29	17	17		29	17	13		29	17	10		29	17	20
30	17	33		30	17	29		30	17	25		30	17	37

MAIE.

First.				*Second*				*Third.*				*Fourth*		
D.	G.	M.		D.	G.	M.		D.	G.	M.		D.	G	M.
1	17	49	*North Declination.*	1	17	45	*North Declination.*	1	17	42	*Northe Declination.*	1	17	53
2	18	4		2	18	1		2	17	57		2	18	8
3	18	19		3	18	15		3	18	12		3	18	23
4	18	33		4	18	30		4	18	26		4	18	37
5	18	48		5	18	45		5	18	40		5	18	51
6	19	2		6	18	59		6	18	55		6	19	6
7	19	16		7	19	13		7	19	10		7	19	20
8	19	30		8	19	27		8	19	25		8	19	33
9	19	43		9	19	39		9	19	36		9	19	46
10	19	55		10	19	51		10	19	49		10	19	59
11	20	8		11	20	5		11	20	2		11	20	11
12	20	19		12	20	17		12	20	14		12	20	23
13	20	31		13	20	29		13	20	26		13	20	35
14	20	43		14	20	41		14	20	38		14	20	46
15	20	55		15	20	52		15	20	49		15	20	58
16	21	5		16	21	3		16	20	59		16	21	8
17	21	16		17	21	13		17	21	10		17	21	19
18	21	25		18	21	24		18	21	20		18	21	28
19	21	35		19	21	33		19	21	30		19	21	38
20	21	45		20	21	43		20	21	40		20	21	48
21	21	52		21	21	51		21	21	49		21	21	54
22	22	1		22	21	59		22	21	56		22	22	4
23	22	9		23	22	8		23	22	6		23	22	11
24	22	17		24	22	15		24	22	13		24	22	19
25	22	24		25	22	2[illegible]		25	22	21		25	22	26
26	22	31		26	22	30		26	22	27		26	22	33
27	22	38		27	22	37		27	22	34		27	22	39
28	22	45		28	22	42		28	22	41		28	22	46
29	22	50		29	22	49		29	22	47		29	22	52
30	22	55		30	22	54		30	22	53		30	22	56
31	23	1		31	23	0		31	22	58		31	23	2

IVNE.

First.				*Second*				*Third.*				*Fourth*		
D.	G.	M.		D.	G.	M.		D.	G.	M.		D.	G	M.
1	23	4	☆ South Declination.	1	23	4	☆ South Declination.	1	23	3	☆ South Declination.	1	23	6
2	23	9		2	23	9		2	23	8		2	23	11
3	23	13		3	23	12		3	23	12		3	23	13
4	23	16		4	23	15		4	23	14		4	23	17
5	23	19		5	23	18		5	23	18		5	23	20
6	23	21		6	23	21		6	23	20		6	23	22
7	23	23		7	23	23		7	23	22		7	23	24
8	23	25		8	23	25		8	23	24		8	23	25
9	23	26		9	23	26		9	23	26		9	23	26
10	23	27		10	23	27		10	23	27		10	23	27
11	23	28		11	23	28		11	23	28		11	23	28
12	23	28	Tropic.	12	23	28	Tropic.	12	23	28	Tropic.	12	23	28
13	23	27	☆ North Declination.	13	23	27	☆ North Declination.	13	23	28	☆ North Declination.	13	23	27
14	23	26		14	23	26		14	23	27		14	23	26
15	23	25		15	23	25		15	23	26		15	23	25
16	23	23		16	23	24		16	23	24		16	23	23
17	23	21		17	23	22		17	23	22		17	23	21
18	23	19		18	23	20		18	23	20		18	23	18
19	23	16		19	23	17		19	23	18		19	23	15
20	23	13		20	23	13		20	23	14		20	23	12
21	23	10		21	23	11		21	23	12		21	23	9
22	23	5		22	23	6		22	23	8		22	23	4
23	23	1		23	23	3		23	22	3		23	23	0
24	22	56		24	22	57		24	22	59		24	22	54
25	22	51		25	22	52		25	22	54		25	22	49
26	22	45		26	22	46		26	22	48		26	22	43
27	22	38		27	22	40		27	22	41		27	22	37
28	22	32		28	22	33		28	22	34		28	22	30
29	22	25		29	22	26		29	22	28		29	22	23
30	22	17		30	22	20		30	22	22		30	22	16

IVLY.

First.				*Second*				*Third.*				*Fourth*		
D.	G.	M.		D.	G.	M.		D.	G.	M		D.	G.	M.
1	22	10	*North Declination.*	1	22	12	*North Declination.*	1	22	13	*North Declination.*	1	22	8
2	22	2		2	22	4		2	22	6		2	21	59
3	21	53		3	21	55		3	21	58		3	21	51
4	21	46		4	21	49		4	21	50		4	21	43
5	21	36		5	21	39		5	21	40		5	21	34
6	21	27		6	21	29		6	21	31		6	21	24
7	21	17		7	21	19		7	21	22		7	21	14
8	21	5		8	21	9		8	21	11		8	21	4
9	20	56		9	20	58		9	21	0		9	20	53
10	20	45		10	20	47		10	20	50		10	20	42
11	20	33		11	20	36		11	20	39		11	20	30
12	20	21		12	20	25		12	20	27		12	20	19
13	20	10		13	20	12		13	20	14		13	20	6
14	19	58		14	20	0		14	20	3		14	19	53
15	19	44		15	19	47		15	19	49		15	19	41
16	19	32		16	19	35		16	19	37		16	19	29
17	19	18		17	19	22		17	19	26		17	19	15
18	19	5		18	19	7		18	19	11		18	19	1
19	18	50		19	18	54		19	18	56		19	18	46
20	18	36		20	18	39		20	18	43		20	18	32
21	18	21		21	18	25		21	18	27		21	18	17
22	18	7		22	18	10		22	18	13		22	18	3
23	17	51		23	17	56		23	17	59		23	17	47
24	17	36		24	17	41		24	17	44		24	17	31
25	17	19		25	17	24		25	17	27		25	17	16
26	17	4		26	17	8		26	17	12		26	17	0
27	16	48		27	16	53		27	16	54		27	16	43
28	16	31		28	16	35		28	16	39		28	16	26
29	16	14		29	16	19		29	16	21		29	16	10
30	15	57		30	16	1		30	16	6		30	15	53
31	15	38		31	15	44		31	15	49		31	15	35

AVGVST.

First.				*Second.*				*Third.*				*Fourth.*		
D.	G.	M.		D.	G.	M.		D.	G.	M.		D.	G.	M.
1	15	21	*North Declination.*	1	15	26	*North Declination.*	1	15	30	*North Declination.*	1	15	17
2	15	3		2	15	9		2	15	13		2	14	59
3	14	44		3	14	50		3	14	55		3	14	40
4	14	26		4	14	32		4	14	36		4	14	22
5	14	8		5	14	14		5	14	18		5	14	4
6	13	49		6	13	54		6	13	59		6	13	44
7	13	29		7	13	35		7	13	40		7	13	25
8	13	10		8	13	15		8	13	21		8	13	6
9	12	15		9	12	56		9	13	2		9	12	47
10	12	32		10	12	37		10	12	42		10	12	28
11	12	12		11	12	17		11	12	23		11	12	7
12	11	52		12	11	57		12	12	2		12	11	47
13	11	31		13	11	37		13	11	42		13	11	27
14	11	11		14	11	17		14	11	22		14	11	7
15	10	51		15	10	56		15	11	1		15	10	46
16	10	39		16	10	36		16	10	41		16	10	25
17	10	9		17	10	14		17	10	19		17	10	3
18	9	47		18	9	52		18	9	58		18	9	42
19	9	26		19	9	31		19	9	37		19	9	21
20	9	5		20	9	10		20	9	15		20	8	59
21	8	44		21	8	48		21	8	54		21	8	38
22	8	22		22	8	27		22	8	33		22	8	16
23	8	0		23	8	5		23	8	11		23	7	54
24	7	38		24	7	44		24	7	49		24	7	32
25	7	16		25	7	22		25	7	26		25	7	10
26	6	53		26	6	59		26	7	4		26	6	47
27	6	31		27	6	37		27	6	41		27	6	25
28	6	9		28	6	15		28	6	19		28	6	3
29	5	46		29	5	52		29	5	57		29	5	40
30	5	23		30	5	29		30	5	34		30	5	17
31	5	1		31	5	7		31	5	11		31	4	55

SEPTEMBER.

First.				Second.				Third.				Fourth		
D.M.G.				D.M.G.				D.M.G.				D.M.G.		
1	4	37	✱South Declination.	1	4	43	✱South Declination.	1	4	49	✱South Declination.	1	4	31
2	4	15		2	4	20		2	4	26		2	4	9
3	3	52		3	3	58		3	4	4		3	3	46
4	3	30		4	3	34		4	3	40		4	3	23
5	3	6		5	3	12		5	3	18		5	3	0
6	2	43		6	2	49		6	2	55		6	2	36
7	2	19		7	2	25		7	2	31		7	2	13
8	1	56		8	2	2		8	2	8		8	1	49
9	1	34		9	1	39		9	1	44		9	1	27
10	1	10		10	1	16		10	1	22		10	1	4
11	0	47		11	0	53		11	0	58		11	0	40
12	0	23		12	0	36		12	0	34		12	0	16
13	0	0	Line.	13	0	6	Line.	13	0	11	Line.	13	0	7
14	0	24	✱North Declination.	14	0	18	✱North Declination.	14	0	12	✱North Declination.	14	0	31
15	0	48		15	0	41		15	0	36		15	0	54
16	1	11		16	1	5		16	1	0		16	1	18
17	1	34		17	1	28		17	1	23		17	1	40
18	1	57		18	1	51		18	1	45		18	2	4
19	2	21		19	2	15		19	2	9		19	2	27
20	2	45		20	2	38		20	2	33		20	2	51
21	3	8		21	3	2		21	2	57		21	3	14
22	3	31		22	3	25		22	3	21		22	3	37
23	3	54		23	3	48		23	3	43		23	4	1
24	4	18		24	4	12		24	4	7		24	4	23
25	4	40		25	4	34		25	4	29		25	4	47
26	5	4		26	4	58		26	4	53		26	5	10
27	5	27		27	5	21		27	5	16		27	5	34
28	5	51		28	5	45		28	5	40		28	5	57
29	6	13		29	6	8		29	6	2		29	6	19
30	6	36		30	6	30		30	6	25		30	6	42

OCTOBER.

Firſt.				*Second.*				*Third.*				*Fourth*		
D.	G.	M.		D.	G.	M.		D.	G.	M.		D.	G.	M.
1	6	59	*North Declination.*	1	6	53	*North Declination.*	1	6	48	*North Declination.*	1	7	5
2	7	22		2	7	16		2	7	10		2	7	27
3	7	45		3	7	39		3	7	33		3	7	50
4	8	7		4	8	1		4	7	56		4	8	12
5	8	30		5	8	24		5	8	18		5	8	35
6	8	52		6	8	46		6	8	41		6	8	57
7	9	14		7	9	7		7	9	3		7	9	19
8	9	36		8	9	29		8	9	25		8	9	40
9	9	58		9	9	51		9	9	45		9	10	2
10	10	19		10	10	13		10	10	8		10	10	24
11	10	42		11	10	35		11	10	30		11	10	46
12	11	3		12	12	57		12	10	52		12	11	8
13	11	24		13	11	18		13	11	13		13	11	28
14	11	45		14	11	38		14	11	34		14	11	49
15	12	5		15	11	59		15	11	55		15	12	10
16	12	26		16	12	20		16	12	16		16	12	31
17	12	46		17	12	40		17	12	36		17	12	51
18	13	6		18	13	0		18	12	56		18	13	11
19	13	26		19	13	20		19	13	15		19	13	31
20	13	46		20	13	40		20	13	35		20	13	51
22	14	6		21	14	0		21	13	55		21	14	11
21	14	25		22	14	20		22	14	15		22	14	30
23	14	44		23	14	39		23	14	34		23	14	49
24	15	3		24	14	58		24	14	54		24	15	8
25	15	22		25	15	17		25	15	12		25	15	26
26	15	40		26	15	35		26	15	31		26	15	45
27	15	59		27	15	54		27	15	50		27	16	4
28	16	17		28	16	12		28	16	8		28	16	21
29	16	34		29	16	29		29	16	25		29	16	38
30	16	52		30	16	47		30	16	43		30	16	56
31	17	10		31	17	4		31	17	0		31	17	13

NOVEMBER.

First.				*Second.*				*Third.*				*Fourth.*		
D.G.M.				D.G.M.				D.G.M.				D.G.M.		
1	17	25	*North Declination.*	1	17	20	*North Declination.*	1	17	17	*North Declination.*	1	17	29
2	17	42		2	17	38		2	17	33		2	17	46
3	17	58		3	17	54		3	17	51		3	18	2
4	18	13		4	18	10		4	18	6		4	18	17
5	18	28		5	18	25		5	18	21		5	18	32
6	18	44		6	18	39		6	18	36		6	18	48
7	18	59		7	18	55		7	18	51		7	19	2
8	19	14		8	19	10		8	19	6		8	19	17
9	19	29		9	19	25		9	19	21		9	19	32
10	19	42		10	19	38		10	19	34		10	19	45
11	19	55		11	19	51		11	19	47		11	19	59
12	20	8		12	20	5		12	20	2		12	20	11
13	20	20		13	20	17		13	20	14		13	20	24
14	20	33		14	20	30		14	20	27		14	20	36
15	20	45		15	20	42		15	20	39		15	20	49
16	20	55		16	20	54		16	20	51		16	20	59
17	21	8		17	21	6		17	21	2		17	21	11
18	21	19		18	21	17		18	21	13		18	21	22
19	21	29		19	21	27		19	21	24		19	21	32
20	21	40		20	21	37		20	21	34		20	21	42
21	21	50		21	21	48		21	21	45		21	21	51
22	21	58		22	21	54		22	21	52		22	22	0
23	22	7		23	22	5		23	22	2		23	22	8
24	22	15		24	22	12		24	22	11		24	22	16
25	22	23		25	22	21		25	22	19		25	22	25
26	22	30		26	22	28		26	22	26		26	22	32
27	22	37		27	22	35		27	22	33		27	22	39
28	22	44		28	22	42		28	22	40		28	22	46
29	22	50		29	22	49		29	22	47		29	22	52
30	22	55		30	22	54		30	22	53		30	22	57

DECEMBER.

First.				*Second*				*Third.*				*Fourth*		
D.G.M				D.G.M.				D.G.M				D.G M.		
1	23	2		1	23	0		1	23	58		1	23	3
2	23	6		2	23	4		2	23	4		2	23	7
3	23	11		3	23	9		3	23	9		3	23	12
4	23	13		4	23	13		4	23	12		4	23	14
5	23	17		5	23	16		5	23	15		5	23	18
6	23	20		6	23	20		6	23	19		6	23	21
7	23	22		7	23	22		7	23	21		7	23	23
8	23	24	*North*	8	23	24	*North*	8	23	23	*North*	8	23	25
9	23	26		9	23	26		9	23	25		9	23	26
10	23	27		10	23	27		10	23	26		01	23	27
11	23	28		11	23	28		11	23	27		11	23	28
12	23	28	Tropic.	12	23	28	Tropic.	12	23	28	Tropic.	12	23	28
13	23	27		13	23	28		13	23	28		13	23	27
14	23	26		14	23	27		14	23	27		14	23	26
15	23	25		15	23	26		16	23	26		15	23	24
16	23	23		16	23	24		16	23	24		26	23	22
17	23	21	*Declination.*	17	23	21	*Declination.*	17	23	22	*Declination.*	17	23	20
18	23	19		18	23	19		18	23	20		18	23	18
19	23	15		19	23	16		19	23	17		19	23	14
20	23	12		20	23	13		20	23	13		20	23	11
21	23	8		21	23	9		21	23	10		21	23	6
22	23	3		22	23	4		22	23	5		22	23	2
23	22	58		23	23	0		23	23	1		23	22	56
24	22	53		24	22	54		24	22	55		24	22	51
25	22	47		25	22	48		25	22	50		25	22	45
26	22	40		26	22	41		26	22	43		26	22	38
27	22	33		27	22	34		27	22	36		27	22	31
28	22	26		28	22	27		28	22	29		28	22	24
29	22	18		29	22	20		29	22	22		29	22	16
30	22	10		30	22	12		30	22	13		30	22	8
31	22	1		31	22	4		31	22	6		31	22	59

How to vſe the Sunnes Declination, for knowyng the eliuation of the Pole.

Firſte, learne whether the Sunne haue Southe *Declination*, or North *Declination*. Then marke the ſhadowe he giueth whether it ſhewe to that parte that he is in, (that is to ſaie, towardes that Pole he is neereſt) or to the contrary parte of the *Equinoctiall*.

If the Sunne giue ſhadowe, the ſame waie that he is from the *Equinoctiall*, he ſhall bee betwene you and the *Equinoctiall*, then take the meridian altitude, and ſubtract it from 90. vnto the reſte, adioyne your *Declination* for the daie, the ſumme of bothe, is the eleuation of the Pole, or your diſtaunce from the *Equinoctiall*.

But if the Sunne giue the ſhadowe to the contrary ſide of the *Equinoctiall* that he is in, (that is to ſaie) the Sunne in North *Declination* giue the ſhadowe Southwarde, or in Southe *Declination* giue the ſhadowe Northwarde, then either the *Equinoctiall* ſhall be betwene you and the Sunne, or you in the *Equinoctiall*, or els you ſhalbe betwéene the *Equinoctiall* and the Sunne, whiche you ſhall thus knowe.

Adde vnto your altitude of the Sunne, the *Declination* for the daie, if it amount to leſſe then 90. ſo muche as it wanteth of 90. you ſhalbe from the *Equinoctiall* that waie that the ſhadowe goeth.

But if it amount iuſte to 90. you ſhalbe vnder the *Equinoctiall*. If it amount to more then 90. ſo muche as amounteth ouer and aboue 90. degrees, you ſhall bee from the *Equinoctiall* towardes the Sunne, betweene the *Equinoctiall* and the

Sunne.

And if at any tyme you ſhall obſerue the Sonnes altitude in your *Zenithe*, then looke what declination it hath, and ſo muche ſhall you bee from the *Equinoctiall*, on the ſame ſide the Sunne is in, but if he haue no *Declination*, then ſhall you bee vnder the *Equinoctiall* line.

A generall and eaſie rule, to knowe by memorie, the Latitude of any place, by the Meridian Altitude, and Declination of the Sunne.

LOoke alwaies how many degrees the Sunnes Meridian altitude wanteth of 90. degrees your *Zenithe*, ſo many degrees of Latitude, is included betweene the place where you obſerue, and the place of *Declination*, or that parte in your Meridian frō the *Equinoctiall*, anſwerable to the Sunnes *Declination* for that daie.

By the Latitude and Declination giuen, to knowe the Sunnes Meridian Altitude in any place.

KNowe the place of the Sunnes *Declination*, and count how many degrees is included, betweene it and the degrees of that Latitude, and looke what it wanteth of 90. degrees, ſhalbe the Meridian Altitude.

¶ Hereafter followeth three Tables the firſte is of the coniunctions of the Sunne and Moone: the ſeconde of their oppoſitions: exactly drawen out of Ioannes Stadius Ephemerides: and the third of the Prime and moueable Feaſtes.

IN the twoo firſt Tables in euery ſquare of euery Colome, you ſhall finde noted three numbers, whiche haue ſeuerall ſignifications: the firſt number is for the daie of the Monethe, the ſeconde for Howers, and the third for Minutes, of the middle inſtant of tyme, for the coniunction, or opoſition of the Sunne and Moone.

Ye are to note, that the naturall daie accoumpted in theſe Tables, beginneth alwaies at the inſtante of Noone or middaie, and continueth till the nexte daie Noone, whiche is the iuſte tyme of 24. howers.

Therefore, when you finde the ſeconde number in any ſquare of the twoo firſt Tables to exceede 12. the ſame is to be accoumpted with the Minutes followyng (whiche is the third mnnber) for ſo muche after midnight, or of the mornyng, or forenoone of the nexte daie.

The vſe of the Tables.

FIrſt ſeeke in the thirde Table the Prime, anſwerable to the yere of our Lorde, Then retourne to the Table of coniunction, or oppoſition of the Moone: and in the firſt colome ſeeke the ſame number of the Prime, Then in the head of the Table, you ſhall ſeeke the Moneth, for whiche you deſire to knowe the coniunction or oppoſition: and diſcendyng doune the ſame Colome, till you come againſt the Prime ſpecified, in that ſquare you ſhall finde three numbers noted, the firſt is for the daie of the Monethe, the ſeconde the hower, and the third the minutes to bee adioyned with the hower, for the middle inſtant of tyme, of the coniuncion or oppoſition.

Example.

This yere 1581. I deſire to knowe the daie of the Moones Coniunction or Chaunge, in the Monethe of Auguſt, I ſeeke in the third Table (or Table of the moueable Feaſtes) for the Prime, and finde it to bee 5. with whiche number I recourne to the firſte Table (whiche is the Table of the coniunction or chaunge) and finde the ſame in the firſte Colome. Then I ſeeke in the heade of the Table for Auguſt, and diſcendyng doune in the ſame Colome, till I come to the ſquare whiche anſwereth to the Prime 5. I finde therein noted 28——16——45. whiche ſignifie that the coniunction is the 28. daie of the Moneth at 16.$^{H.}$——45.$^{M.}$——and becauſe the seconde number exceedeth 12. therefore I ſaie that the coniunction ſhalbee the 29, daie at 4.$^{H.}$——45.—$^{M.}$ in the mornyng.

But if ye finde in any one ſquare three numbers double noted, thei doe ſignifie that in the ſame Moneth there is twoo coniunctions or oppoſitions, and likewiſe doe ſhewe the daies howers, and minutes thereof.

If in any ſquare in the Colome of any Moneth in the Table of coniunction, you finde noted this marke *. the ſame doeth ſignifie the Eclipſe of the Sunne at the inſtante of time noted for the coniunction in that Moneth.

Likewiſe, if in any ſquare in the Table of the oppoſitions or full Moones, you finde this marke ☾. the ſame doeth ſignifie the Eclipſe of the Moone, at the inſtante of tyme noted in the ſame ſquare.

The firſt Table for the coniunction

Prime.	*Januarie.*	*Februarie.*	*Marche.*	*Aprill.*	*Maie.*	*June.*	*Julie.*	*Auguſt.*	*September.*	*October.*	*Nouember.*	*December.*
1	18	17	19	17	17	15	15	13	11	11	9	9
	11	6	0	15	4	15	0	8	15	2	6	0
	12	0	5	44	46	35	47	43	51	0	54	9
2	7	6	7	6	6	4	4	2	1	30	28	28
	14	5	23	16	10	23	12	23	8	3	13	0
	0	5	50	54	14	11	41	7	51	50	52	34
	26	25	27	25	25	23	23	21	20	19	18	17
	12	2*	6	9	1	16	6	18	8	19	6	17
	56	48	0	48	27	24	44	50	1	23	11	19
4	16	14	15	13	13	11	11	10	8	8	6	6
	2	12	0	12	3	17	8	0	15	5	19	7
	3	50	38	55	3	19	20	14	38	53	16	35
5	4	3	4		2 31	30	30	28	27	27	25	25
	18	4	14	0	10 1	10	0	16	9	2	18	8
	21	23	6	10	0 17	11	51	45	32	32	0	15
6	23	22	23	22	21	19	19	17	16	16	14	14
	20	6	15	0	8	*17	4	18	9	3	21	14
	5	32	20	17	15	40	54	10	49	15	47	39
7	13	11	13	11	11	9	8	7	5	5	3	3
	9	19	7	16	0	7	15	1	14	3	21	16
	23	[illegible]	36	30	9	39	48	20	0	58	15	21
8	2	1	1 31	29	29	27	26	24	23	23	21	21
	11	5	9	16	1	8	16	23	10	0	16	11
	40	5	46 37	56	0	0	48	53	44	2	24	14
9	20	19	20	19	18	17	16	14	13	12	10	10
	5	0	17	5	16	0	8	15	0	9	21	12
	56	45	4	45	24	49	24	51	5	47	58	56
10	9	8	9	8	8	6	5	4	2	2 31	29	29
	0	0	18	11	1	13	23	8	16	1 10	22	11
	40	36	49	39	54	47	50	33	48	17 45	0	11

Prime.	Januarie.	Februarie.	Marche.	Aprill.	Maie.	June.	Julie.	August.	September.	October.	Nouember.	December.
11	28 2 0	26 17 23	28 12 2	27 4 43	26 19 54	25 9 18	23 21 20	23 7 38	21 17 41	21 3 6	19 12 31	18 23 5
12	17 10 35	15 23 56	16 14 17	15 5 26	14 20 55	13 12 13	13 3 12	11 17 0	10 5 54	9 17 29	8 4 38	7 15 12
13	6 1 29	4 11 56	5 22 47	4 10 47	3 23 36	2 13 18	2 4 19	30 11 20	29 2 29	28 17 0	27 5 46	26 17 23
14	25 3 44	23 13 35	24 22 40	23 8 46	22 19 3	21 6 51	20 *20 45	19 11 51	18 4 22	17 21 51	16 14 30	16 5 30
15	14 18 23	13 5 50	14 15 0	12 23 35	12 7 51	10 16 29	10 2 33	8 14 45	7 5 22	6 21 48	5 16 21	5 10 47
16	4 4 17	2 18 40	3 6 35	1 16 20	30 7 32	28 15 17	28 0 3	26 10 40	25 0 0	24 16 12	23 10 47	23 6 8
17	22 0 39	20 16 45	22 5* 55	20 16 25	20 0 42	18 8 6	17 15 32	15 23 13	14 8 47	13 20 50	12 11 55	12 5 32
18	11 0 32	9 19 43	11 13 0	10 3 4	9 15 3	8 0 32	7 8 25	5 16 0	3 23 36	3 8 43	1 19 44	1 31 9 1 18 27
19	29 19 12	28 13 42	30 6 56	27 22 30	28 11 38	26 22 7	26 8 0	24 16 25	23 1* 6	22 10 3	20 20 26	20 7 19

The ſecond Table ſheweth

Prime.	*Januarie.*	*Februarie.*	*Marche.*	*Aprill.*	*Maie.*	*June.*	*Julie.*	*August.*	*September.*	*October.*	*Nouember.*	*December.*
1	4 3 7	2 12 42	3 22 21	2 7☾ 24	1 31 16 2 45 52	29 14 13	29 3 54	27 19 19	26 12☾ 20	26 6 0	25 1 17	25 5 23
2	23 3 24	21 14 25	22 23 52	21 8 6	20 15 59	19 00 22	18 10 14	16 22 7	15 ☽12 46	15 5 56	14 0 44	13 19 30
3	12 12 33	11 3 14	12 17 0	11 0 41	10 8 58	8 16 14	7 23 25	6 8 5	4 18 38	4 8 13	3 0 33	2 18 48
4	1 31 14 3☾ 8 46		1 0 28	29 0 32	28 9 17	26 16 21	25 23 31	24 7 47	22 17 16	22 6 36	20 20 22	20 15 4
5	19 8☾ 48	18 3 30	19 20 35	18 11 22	17 22 53	16 8 19	15 ☾16 40	14 0 30	12 7 10	11 17 33	10 4 39	9 17 55
6	8 9☾ 48	7 3 7	8 21 22	7 14 22	7 5 40	5 19 6	5 6 14	3 17 27	2 1 10	1 30 9 19 50 7	29 5 14	28 20 48
7	27 7 20	25 22 45	27 14 48	26 7 5	25 22 48	24 13 12	24 2 46	22 14 19	21 1 13	20 11 17	18 21 36	18 7 13
8	16 18 38	15 6 5	15 19 0	14 8 56	13 23 15	12 14 50	12 6 4	10 20 53	9 11 4	9 0 18	7 12 17	6 23 40
9	5 9 36	3 20 0	5 5 51	3 16 44	3 4 27	1 17 0	1 30 7 22 9 17	29 14 15	28 6 33	27 22 6	26 12 24	26 1 10
10	24 12 5	22 22 0	24 6 54	22 15 51	22 1 14	20 11 54	20 0 25	18 14 53	17 7 14	17 0 42	15 18 26	15 11 19

the full Moones for xix. yeres.

Prime.	*Ianuarie.*	*Februarie.*	*Marche.*	*Aprill.*	*Maie.*	*Iune.*	*Iulie.*	*August.*	*September.*	*October.*	*Nouember.*	*December.*
11	14 1 30	12 13 37	13 23 35	12 8 0	11 15 54	9 23 40	9 8 49	7 19 13	6 8☾ 58	6 0 32	4 21 19	4 0 0
12	3 8 8	2 0 25	2 ☾13 42	1 30 0 8 21 54	29 16 19	27 23 22	27 7 37	25 ☾16 49	24 4 51	23 19 36	22 13 19	22 8 30
13	21 3 51	19 21 0	21 11 53	19 23 34	19 9 8	17 16 47	16 23 51	15 7☾ 25	13 16 12	13 2 54	11 16 26	11 8 56
14	10 3 6	8 22 21	10 16 5	9 7 42	8 20 49	7 7 13	6 16 20	5 0 11	3 8 9	2 16 48	1 30 3 15 0 14	30 5☾ 48
15	18 22 37	27 16 22	29 9 37	28 2 0	27 16 7	26 4 25	25 15 13	24 0 33	22 9 35	21 18 30.	20 4 7	19 ☾15 34
16	18 4 38	16 18 42	17 10 27	16 2 35	15 18 25	14 9☾ 30	13 23 36	12 12 8	10 23 41	10 10 19	8 20 30	8 6☾ 37
17	6 17 12	5 4 17	6 15 11	5 5 38	4 20 14	3 10 25	3 1 35	1 31 16 7 48 36	29 21 35	29 10 34	27 22 43	27 9 12
18	25 19 15	24 5 12	25 15 13	24 2 15	23 14 25	22 3 11	21 18 0	20 9 29	19 2 8	18 ☾18 16	17 9 32	16 23 14
19	15 11 6	14 2 34	15 6 32	13 ☾15 12	13 0 9	11 9 53	10 21 31	9 10 48	8 2 23	7 19 21	6 13 35	6 7 8

¶ A Table far 26. yeres ſhewyng the Prime, the Epacte, and Dominicall letter. And alſo what daie of the moneth theſe moueable feaſtes falleth on. And here alwaies ye ſhall note, that the Epact changeth the firſt of Marche, and the Prime and Dominicall letter the firſt of Ianuarie: where you ſee twoo Dominicall letters, that is the leape yere.

Anno Domini.	The Prime.	The Epact.	Dominicall letter.	Eaſter daie.	Regation Sundaie.	Aſcention daie.	Whitſondaie.	Aduent Sundaie.
1581	5	25	A	26. March	30. Aprill	4. Maie	14. Maie	3. Decẽb.
1582	6	6	G	15. Aprill	20. Maie	24. Maie	3. Iune	2 Decẽb.
1583	7	17	F	31 March	5. Maie	9. Maie	10. Maie	1. Decẽb.
1584	8	28	ED	19. Aprill	24. Maie	28. Maie	7. Iune	29. Noue.
1585	9	9	C	11. Aprill	16. Maie	20. Maie	30. Maie	28. Nouẽ.
1586	10	20	B	3. Aprill	8. Maie	12. Maie	22. Maie	27. Nouẽ
1587	11	1	A	16. Aprill.	21. Maie.	25. Maie	4. Iune.	3. Decẽb.
1588	12	12	GF	7. Aprill.	12. Maie.	16. Maie	26. Maie	1. Dicẽb.
1589	13	23	E	30. March	4. Maie.	8. Maie	18. Maie	30. Nouẽ.
1590	14	4	D	19. Aprill.	24. May	28. Maie	7. Iune.	29. Nouẽ.
1591	15	15	C	4. Aprill	9. May	13. Maie	23. Maie	28. Nouẽ.
1592	16	26	BA	29. March	30. Aprill	4. Maie	14. Maie	3. Decẽb.
1593	17	7	G	15. Aprill	20. May	24. Maie	3. Iune.	2. Decẽb
1594	18	18	F	31. March	5. May	9. Maie	19. May	1. Decẽb
1595	19	29	E	20. Aprill	25. May	29. Maie	8. Iune.	30. Nouẽ.
1596	1	11	DC	11. Aprill	16. Maie	20. May	30. Maie	28. Nouẽ.
1597	2	22	B	27. March	1. May	5. Maie	15. May	27. Nouẽ.
1598	3	3	A	16. Aprill	21. May	25. Maie	4. Iune.	3. Decẽb
1599	4	14	G	8. Aprill	13. May	17. Muie	27. Maie	2. Decẽb.
1600	5	25	FE	23. March	27. Aprill	1. Maie	11. Maie	30. Nouẽb
1601	6	6	D	12. Aprill	17. May	21. Maie	31. Maie	29. Mouẽ.
1602	7	17	C	4. Aprill	9. May	13. Maie	23. Maie	28. Nouẽ.
1603	8	28	B	24. Aprill	29. May	2. Iune.	12. Iune	27. Nouẽ.
1604	9	9	AG	8. Aprill	13. May	17. Maie	27. Maie	2. Decẽb
1605	10	20	F	31. March	5. May	9. Maie	19. Maie	1. Decẽb.
1606	11	1	E	20. Aprill	25. May	29 Maie.	8 Iune.	30. Nouẽ.

The contentes of the *Kalender.*

IN the firſte and ſeconde colome, vnder the title daies, are the daies of the monethe, and Dominicall letters, the third is of the feaſtes: the fowerth colome ſheweth how many howers and Minutes the daie containeth from Sunne riſyng, to Sunne ſettyng, the Pole beyng eleuated 52. degrees. The fiueth colome of the 27. letters, ſerueth with the helpe of a Table followyng, to knowe what ſigne the Moone is in at all tymes.

How by the length of the daie is knowen the length of the night, with the hower and minute of the Sunnes riſyng and ſettyng.

Deuide the length of the daie, whiche you ſhall find in the Kalender, into twoo partes equally, the one halfe ſheweth the howers, and minutes of the Sunnes ſetting, the howers and minutes of the ſettyng, beeyng ſubſtracted from 12. the remaine ſheweth the howers and minutes of the riſyng, the whole arcke or length of the daie, beyng ſubſtracted from 24. the reſte ſheweth the length of the night (that is to ſaie) from Sunne ſettyng, to Sunne riſyng.

As for example.

The 15. of Ianuarie, I finde in the Kalender the length of the daie to bee 8. howers, 30. minutes, whiche beyng deuided, the halfe thereof is 4. howers 15. minutes, the Sunnes ſettyng that daie: this 4. hower 15. minutes ſubſtracted from 12. reſteth 7. howers 45. minutes, whiche is the hower of the Sunnes riſyng: ſubſtracte 8. hower 39. minutes the whole length of the daie, out of 24. reſte 15. hower 30. minutes, whiche is the length of the night that daie of the monethe.

The Kalender.

Daies.		Ianuarie.	Length of the daie.		D
1	A	*Newe yeres daie.*	7	25	a
2	b	Octa. Stephen.	7	55	b
3	c	Octa. Ihon.	7	58	c
4	d	Octa. Innocent.	8	0	d
5	e	Depo. of Edwa.	8	3	e
6	f	*Twelfth daie.*	8	6	f
7	g	Felix and Janua.	8	8	g
8	A	Lucian Prieſt.	8	11	h
9	b	Joyce virgine.	8	14	i
10	c		8	16	k
11	d	*Sol in Aquaris.*	8	18	l
12	e	Atlas.	8	20	m
13	f	Hillarie biſhop.	8	24	n
14	g	Felicia.	8	26	o
15	A	Maurice.	8	30	p
16	b	Marcell.	8	32	q
17	c	Depoſ. of Antho.	8	36	r
18	d	Priſca Virgine.	8	40	ſ
19	e	Wolſtane biſhop	8	42	s
20	f	Fabian and Seb	8	46	t
21	g	Agnes Virgine.	8	50	v
22	A	Vincent martyr.	8	52	u
23	b	Timothe.	8	56	x
24	c	Emerice.	9	0	y
25	d	*Conuer. of Paule.*	9	4	z
26	e	Policarp martyr.	9	6	&
27	f	Chriſoſto. doctor.	9	10	ſt
28	g	Theoder Prieſt.	9	14	a
39	A	Valerie biſhop.	9	18	b
30	b	Bateld Queene.	9	22	c
31	c	Saturne & Vice.	9	26	d

Daies.		Februarie.	Length of the daie.		☾
1	d	☾ Faſt.	9	28	e
2	e	*Puriſi. of Marie.*	9	32	f
3	f	Blaſe Martire.	9	36	g
4	g	Gilbert confeſſor.	9	40	h
5	A	Agathe Virgine.	9	44	i
6	b	Dorothe Virgin.	9	48	k
7	c	Angulle.	9	52	l
8	d	Sallanion.	9	56	m
9	e	*Sunne in Piſces.*	10	0	n
10	f	Scollaſtica.	10	4	o
11	g	Sother biſhop	10	8	p
12	A	Eufraſe Virgine	10	10	q
13	b		10	14	r
14	c	Valentine.	10	18	s
15	d		10	22	ſ
16	e	Julian Virgine	10	26	t
17	f	Germaine	10	30	v
18	g	Huge biſhop	10	34	u
19	A	Simeon	10	38	x
20	b	Mildred	10	42	y
21	c	Lxxix. Martirs	10	46	z
22	d	Peters Chaires.	10	50	&
23	e	☾ Faſt,	10	54	ſt
24	f	*Mathie Apoſt.*	10	58	a
25	g	Inuent. Paule	11	2	b
26	A	Neſtor	11	7	c
27	b	Alexander	11	12	d
28	c	Auguſtine	11	16	e

Daies.		Marche.	Length of the daie.		☾
1	d	Dauid	11	24	f
2	e	Chadde	11	28	g
3	f	Maurice	11	32	h
4	g	Adꝛian	11	36	i
5	A	Focas and Euſe.	11	40	k
6	b	Viet and Venin.	11	44	l
7	c	Perpetu.	11	48	m
8	d	Depoſi. of Felix.	11	52	n
9	e	Fourtie martirs.	11	56	o
10	f	Agapit.	12	0	p
11	g	*Sunne in Aries.*	12	4	q
12	A	Gregoꝛie biſhop.	12	8	r
13	b	Theodoꝛe	12	12	ſ
14	c	Candide	12	16	s
15	d	Longine	12	20	t
16	e	Hilla and Ionaſe.	12	24	v
17	f	Gertude.	12	28	u
18	g	Edward kyng	12	32	x
19	A	Ioſeph Ma. houſ.	12	36	y
20	b	Cuthbert	12	40	z
21	c	Benedict.	12	44	&
22	d	Afrodoſe.	12	48	ſt
23	e	Theodoꝛe	12	54	a
24	f	¶ Faſt	12	58	b
25	g	*Annun. of Marie*	12	2	c
26	A	Caſtoꝛ martire.	13	6	d
27	b	Marciany	13	10	e
28	c	Rupert	13	14	f
29	d	Victoꝛine	13	18	g
30	e	Quirine	13	22	h
31	f	Adeline	13	26	i

Daies.		Aprill.	Length of the daies.		☾
1	g	Gilbard.	13	30	k
2	A	Marie Egipt.	13	34	l
3	b	Richard biſhop	13	38	m
4	c	Ambꝛoſe	13	42	n
5	d	Vincent	13	46	o
6	e	Sextus	13	50	p
7	f	Euphemie.	13	52	q
8	g	Dioniſies	13	56	r
9	A	Perpetuus	14	0	ſ
10	b	Apolinia	14	2	s
11	c	*Sunne in Taurus.*	14	4	t
12	d	Sother	14	8	v
13	e	Marcus	14	12	u
14	f	Tiburtie	14	16	x
15	g	Oſmond	14	20	y
16	A	Iſidoꝛie	14	24	z
17	b	Aniſette	14	28	&
28	c	Elutherius	14	32	ſt
19	d	Alphege	14	34	a
20	e	Victoꝛ	14	38	b
21	f	Simion	14	42	c
22	g	Sother	14	46	d
23	A	Geoꝛge martire.	14	50	e
24	b	Wilfride	14	54	f
25	c	*Marke Euangel.*	14	56	g
26	d	Clete	15	0	h
27	e	Anaſtaſius	15	4	i
28	f	Vitales	15	8	k
29	g	Peter of Milane	15	10	l
30	A	Depo. of Erken.	15	14	m

The Kalender.

Daies.		Maie.	Length of the daie.		D
1	b	*Philip and Iacob*	15	18	n
2	c	Athanaſius	15	20	o
3	d	Inuen. of ẏ croſſe	15	24	p
4	e	Chriſtopher.	15	28	q
5	f	Godarde.	15	29	r
6	g	Ihon port Latine	15	30	ſ
7	A	Ihon of Beuerlie	15	34	s
8	b	Aper. of Michael	15	36	t
9	c	Tranſ. of Nicho.	15	40	v
10	d	Gordian	15	42	u
11	e	Anthonie	15	44	x
12	f	*Sunne in Gemini,*	15	46	y
13	g	Seruſius	15	49	z
14	A	Boniface martir.	15	52	&
15	b	Iſidore	15	54	ſt
16	c	Dioſcor martyre	15	57	a
17	d	Dunſtane	15	0	b
18	e	Bernardine	16	2	c
19	f	Aquilla	16	5	d
20	g	Donſton	16	8	e
21	A	Bernardine	16	10	f
22	b	Helena Queene.	16	12	g
23	c	Dſiocri	16	14	h
24	d	Serule	16	15	i
25	e	Urbane.	16	16	k
26	f	Adelme confeſſor	16	18	l
27	g	Bede Prieſt	16	19	m
28	A	Germane	16	20	n
29	b	Corone	16	21	o
30	c	Felix	16	22	p
31	d	Petronill	16	23	q

Daies.		Iune.	Length of he daie.		☾
1	f	Nichomede	16	24	r
2	f	Marcell	16	25	s
3	g	Eraſmus	16	26	ſ
4	A	Petrocus	16	27	t
5	b	Boniface	16	[illegible]	v
6	c	Melon	16	2[illegible]	u
7	d	Paule biſhop	16	29	x
8	e	Trāſ. of Edmond	16	30	y
9	f	Ianua. confeſſor.	16	30	z
10	g	Tran. of Wolſt.	16	30	&
11	A	Barnard apo.	16	30	ſt
12	b	*Sunne in Cancer.*	16	30	a
13	c	Anthonie	16	30	b
14	d	Baſilides	16	30	c
15	e	Uite and Mode.	16	29	d
16	f	Tran. of Richard	16	28	e
17	g	Botulphe	16	28	f
18	A	Mar. and Marſel	16	27	g
19	b	Geruaſius	16	27	h
20	c	Tran. of Edwar.	16	26	i
21	d	Walburge	16	25	k
22	e	Albane	16	24	l
23	f	¶ Faſt	16	23	m
24	g	*Ihon Baptiſt*	16	22	n
25	A	Amandi	16	20	o
26	b	Ihon and Paule	16	19	p
27	c	Creeſcence	16	18	q
28	d	¶ Faſt.	16	16	r
29	e	*Peter and Paule*	16	15	ſ
30	f	Com. of Paule	16	14	s

Daies.		Iulie.	Length of the daie.		☾
1	g	Octa. of Ihon	16	12	t
2	A	Viſita. of Marie	16	10	v
3	b	Trã. of Thomas	16	8	u
4	c	Tran. of Martin.	16	5	x
5	d	CCC. Virgines	16	3	y
6	e	Martalis	16	2	z
7	f	Zenone Martyre.	16	0	&
8	g	Depo. of Grem.	15	57	ſt
9	A	Crile biſhopp	15	54	a
10	b	*Dog daies begin.*	15	52	b
11	c	Seuen brethren	15	49	c
12	d	Nabor and Felix	15	46	d
13	e	*Sunne in Leo.*	15	44	e
14	f	Reuell	15	42	f
15	g	Tranſlat. Suite	15	40	g
16	A	Tranſl. Oſmond	15	36	h
17	b	Katherine	15	34	i
18	c	Arnulfe	15	30	k
19	d	Ruſian and Iuſt.	15	28	l
20	e	Margaret	15	24	m
21	f	Praxede	15	20	n
22	g	Marie Magdalen	15	18	o
23	A	Apolinaries	15	14	p
24	b	☙ Faſt	15	10	q
25	c	*Iames Apoſtle.*	15	8	r
26	d	Anne mot. Marie	15	4	ſ
27	e	VII. Slepers	15	0	s
28	f	Sampſon	14	58	t
29	g	Martha	14	56	v
30	A	Abdon and Sen.	14	54	u
31	b	German	14	50	x

Daies.		Auguſt.	Length of the daies.		☾
1	c	Lamas	14	46	y
2	d	Stephen	14	42	z
3	e	Inuent. Sept	14	38	&
4	f	Iuſtine	14	34	ſt
5	g	Feſtum Niuis	14	32	a
6	A	Tranſfi. of Chriſt	14	28	b
7	b	Feaſt of Ieſus	14	24	c
8	c	Ciriacke	14	20	d
9	d	Roman Martyre	14	16	e
10	e	Laurence martyr	14	12	f
11	f	Cutbert	14	8	g
12	g	Clarie	14	4	h
13	A	Hiplite	14	0	i
14	b	*Sunne in Virgo*	13	56	k
15	c	Aſſump. Marie	13	52	l
16	d	Roch martyre	13	50	m
17	e	Octa. Laurence	13	46	n
18	f	Leus	13	42	o
19	g	Barnerd	13	38	p
20	A	*Dogge daies ende*	13	34	q
21	b	Priuate	13	30	r
22	c	Timothe	13	26	ſ
23	d	☙ Faſt	13	22	s
24	e	*Barthol. Apoſtle*	13	18	t
25	f	Lewes Kyng	13	14	v
26	g	Seuerne	13	10	u
27	A	Ruſine martyre	13	8	x
28	b	Auguſtine biſhop	13	6	y
29	c	Ihon behedded	13	2	z
30	d	Felix and Audas	12	58	&
31	e	Cutbbert	12	54	ſt

Daies.		Septemb.	Length of the Daie.		☾
1	f	Giles.	12	48	a
2	g	Anthonie martir.	12	44	b
3	A	Lupus biſhop.	12	40	c
4	b	Tranſ.Cuthbert	12	36	d
5	c	Bertine	12	32	e
6	d	Eugenius	12	28	f
7	e	*Nati.Eliza.Reg.*	12	24	g
8	f	*Natiui.of Marie*	12	20	h
9	g	Gorgonie.	12	16	i
10	A	Siluius biſhop	12	12	k
11	b	Protec. and Hiſt.	12	8	l
12	c	Martinian	12	4	m
13	d	*Sunne in Libra.*	12	0	n
14	e	Holie Croſſe	11	56	o
15	f	Philetus	11	52	p
16	g	Edith	11	48	q
17	A	Lambert	11	44	r
18	b	Vict.and Cor.	11	40	ſ
19	c	Ianuarie martir.	11	36	s
20	d	¶ Faſt.	11	32	t
21	e	*Mathew Apoſt.*	11	28	v
22	f	Maricius	11	24	u
23	g	Tecla Virgine	11	20	x
24	A	Andochius	11	16	y
25	b	Firmine	11	12	z
26	c	Sipri and Iuſt.	11	6	&
27	d	Coſme and Da.	11	2	ſt
28	e	Exuperius	10	58	a
29	f	*Michaell Arch.*	10	54	b
30	g	Hierome prieſt	10	50	c

Daies.		October.	Length of the Daie.		☾
1	A	Remigius.	10	46	d
2	b	Leodegarie	10	24	e
3	c	Candide.	10	38	f
4	d	Fraunces	10	34	g
5	e	Apoline	10	30	h
6	f	Faithe.	10	26	i
7	g	Martine.	10	22	k
8	A	Pellagius	10	18	l
9	b	Gereon and Vic.	10	14	m
10	c	Nicaſius.	10	10	n
11	d	Edward kyng.	10	8	o
12	e	Adorant	10	4	p
13	f	Calixtes.	10	0	q
14	g	*Sunne in Scorpio.*	9	56	r
15	A	Wolfran	9	52	ſ
16	b	Mich.of the mou:	9	48	s
17	c	Etheldred	9	44	t
18	d	*Luke Euangeliſt.*	9	40	v
19	e	Fredeſwide	9	36	u
20	f	Auſterbert.	9	32	x
21	g	Xi.M. Virgines,	9	28	y
22	A	Marie Salamon.	9	26	z
23	b	Romaine	9	22	&
24	c	Maglorie	9	18	ſt
25	d	Criſpine.	9	14	a
26	e	Vrſula.	9	10	b
27	f	¶ Faſt.	9	6	c
28	g	*Simon and Iude.*	9	4	d
29	A	Marſiſus	9	0	e
30	b	German	8	56	f
31	c	¶ Faſt	8	52	g

Daies.		Nouemb.	Length of the Daie.		☾
1	d	*All Saínctes.*	8	50	h
2	e	All Soules.	8	46	i
3	f	Wenefride.	8	43	k
4	g	Amantius	8	40	l
5	A	Lete Prieſt	8	36	m
6	b	Leonard	8	32	n
7	c	Wilbrode	8	30	o
8	d	Fower Crouned	8	26	p
9	e	Theodore	8	24	q
10	f	Benet	8	20	r
11	g	Martine biſhop	8	18	ſ
12	A	Paterne	8	16	s
13	b	*Sunne in Sagitta.*	8	14	t
14	c	Tranſla. Erken.	8	11	v
15	d	Machute.	8	8	u
16	e	Depoſ. Edmond	8	6	x
17	f	*Initi. Regi Eliza.*	8	3	y
18	g	Octa.; Marie	8	0	z
19	A	Eliza. martyre	7	58	&
20	b	Edmond kyng	7	55	ſt
21	c	Preſenta. Marie	7	52	a
22	d	Cecill virgine	7	50	b
23	e	Clement	7	47	c
24	f	Griſogon	7	45	d
25	g	Katherine	7	44	e
26	A	Line	7	4	f
27	b	Agricola	7	41	g
28	c	Rufus martyre	7	40	h
29	d	Satu. ¶ Faſt	7	38	i
30	e	*Andrew Apoſt.*	7	37	k

Daies.		Decemb.	Length of the Daie.		☾
1	f	Elegius	7	36	l
2	g	Libaue	7	35	m
3	A	Depo. Oſmond	7	34	n
4	b	Barbara	7	33	o
5	c	Saua	7	32	p
6	d	Nicholas biſhop	7	32	q
7	e	Ambroſe	7	31	r
8	f	Concep. of Marie	7	30	ſ
9	g	Ciprian	7	30	s
10	A	Eulalie	7	30	t
11	b	Damaſe	7	30	v
12	c	*Sunne in Caprico.*	7	30	u
13	d	Luce virgine	7	30	x
14	e	Nicaſius biſhop	7	30	y
15	f	Valerius	7	31	z
16	g	Lazarus cõfeſſor	7	32	&
17	A	O ſapientie	7	32	ſt
18	b	Gracian	7	33	a
19	c	Veneſia virgine	7	34	b
20	d	¶ Faſt.	7	35	c
21	e	*Thomas Apoſtle*	7	36	d
22	f	XXX. Martyres	7	37	e
23	g	Victor virgine	7	38	f
24	A	¶ Faſt.	7	40	g
25	b	*Chriſtmas daie*	7	41	h
26	c	*Stephen martyre*	7	42	i
27	d	*Ihon Euangeliſt*	7	44	k
28	e	*Innocentes daie*	7	45	l
29	f		7	46	m
30	g	Tranſ. of James	7	48	n
31	A	Silueſter.	7	50	o

A Table wherein is ſhewed at all tymes, what *ſigne the Moone ſhalbe in, by the Prime, and helpe of the letters in the laſte Colome of the Kalender, as by example is hereafter ſhewed.*

The Prime.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Aries.	y	n	c	v	l	ſt	ſ	h	z	p	e	u	m	a	s	i	&	q	f
Aries.	z	o	d	u	m	a	s	i	&	q	f	x	n	b	t	k	ſt	r	g
Aries.	&	p	e	x	n	b	t	k	ſt	r	g	y	o	c	v	l	a	ſ	h
Taurus.	ſt	q	f	y	o	c	v	l	a	ſ	h	z	p	d	u	m	b	s	i
Taurus.	a	r	g	z	p	d	u	m	b	s	i	&	q	e	x	n	c	t	k
Gemini.	b	ſ	h	&	q	e	x	n	c	t	k	ſt	r	f	y	o	d	v	l
Gemini.	c	s	i	ſt	r	f	y	o	d	v	l	a	ſ	g	z	p	e	u	m
Cancer.	d	t	k	a	ſ	g	z	p	e	u	m	b	s	h	&	q	f	x	n
Cancer	e	v	l	b	s	h	&	q	f	x	n	c	t	i	ſt	r	g	y	o
Leo.	f	u	m	c	t	i	ſt	r	g	y	o	d	v	k	a	ſ	h	z	p
Leo.	g	x	n	d	v	k	a	ſ	h	z	p	e	u	l	b	s	i	&	q
Leo.	h	y	o	e	u	l	b	s	i	&	q	f	x	m	c	t	k	ſt	r
Virgo.	i	z	p	f	x	m	c	t	k	ſt	r	g	y	n	d	v	l	a	ſ
Virgo.	k	&	q	g	y	n	d	v	l	a	ſ	h	z	o	e	u	m	b	s
Libra.	l	ſt	r	h	z	o	e	u	m	b	s	i	&	p	f	x	n	c	t
Libra.	m	a	ſ	i	&	p	f	x	n	c	t	k	ſt	q	g	y	o	d	v
Scorpio.	n	b	s	k	ſt	q	g	y	o	d	v	l	a	r	h	z	p	e	u
Scorpio.	o	c	t	l	a	r	h	z	p	e	u	m	b	ſ	i	&	q	f	x
Sagittarius	p	d	v	m	b	ſ	i	&	q	f	x	n	c	s	k	ſt	r	g	y
Sagittarius	q	e	u	n	c	s	k	ſt	r	g	y	o	d	t	l	a	ſ	h	z
Sagittarius	r	f	x	o	d	t	l	a	ſ	h	z	p	e	v	m	b	s	i	&
Capricorne	ſ	g	y	p	e	v	m	b	s	i	&	q	f	u	n	c	t	k	ſt
Capricorne	s	h	z	q	f	u	n	c	t	k	ſt	r	g	x	o	d	v	l	a
Aquarius	t	i	&	r	g	x	o	d	v	l	a	ſ	h	y	p	e	u	m	b
Aquarius.	v	k	ſt	ſ	h	y	p	e	u	m	b	s	i	z	q	f	x	n	c
Piſces.	u	l	a	s	i	z	q	f	x	n	c	t	k	&	r	g	y	o	d
Piſces.	x	m	b	t	k	&	r	g	y	o	d	v	l	ſt	ſ	h	z	p	e
Piſces.	y	n	c	v	l	ſt	ſ	h	z	p	e	u	m	a	s	i	&	q	f

The vſe of the Table.

FIrſt goe to the Kalender, to the daie of the moneth whiche ye deſire to knowe what ſigne the Moone is in: And in the laſte Colome of that moneth, vnder the Moone in the head thereof, directly againſt the ſame daie, you ſhall finde one of the 24. letters, whiche you ſhall beare in memorie, and retourne to the Prime of the preſent yere, in the heade of this Table, deſcendyng doune by the Colome of the ſame Prime, vntill ye finde the letter ye beare in memorie of the Kalender, and directly againſt this ſquare, or letter in the firſt Colome ye ſhall finde named the ſigne that the Moone them occupieth.

As for example.

This yere 1581. the 12. of June, I deſire to knowe what ſigne the Moone is in, I goe to the Kalender to that moneth of June, to the 12. daie, againſt whiche in the laſt Colome, vnder the Moone, in the head of the moneth I finde the letter a, whiche bearyng in memorie, I retourne to this Table, to the Prime of this yere, whiche I ſeeke in the Table of the moueable feaſtes, and finde to be 5. where I euter the Table, in the heade, and in the ſixth Colome, deſcendyng doune vntill I finde a, againſt whiche to the lefte hande, in the firſte colome, I ſinde *Scorpio*, whiche ſheweth the Moone to bee in that ſigne.

The contentes of this booke.

¶ The firſt Chapter.

OF the *Magnes* or *Lodeſtone*, where thei are found, and of their colours, weight, and vertue in drawyng Iron, or Steele, and of other properties of the ſame Stone.

¶ The ſeconde Chapter.

Of the diuers opinions of thoſe that haue written of the *Attractiue* poinct, and where thei haue imagined it to bee.

¶ The third Chapter.

By what meanes the rare and ſtraunge *Declinyng* of the Needle, from the plaine of the Horizon was firſt founde.

¶ The fowerth Chapter.

How to finde the greateſt *Declinyng* of the Needle vnder the Horizon.

¶ The fifth Chapter.

That in the vertue of the *Magnes* or *Lodeſtone*, is no ponderous or weightie matter, to cauſe any ſuche *Declinyng* in the Needle.

¶ The ſixt Chapter.

A confutation of the cõmon receiued oponion of the point *Attractiue*.

¶ The ſeuenth Chapter.

Of the poinct *Reſpectiue*, where it maie bee by greateſt reaſon imagined.

¶ The eight Chapter.

Certaine proofes of the power and action, wholie and freelie beeyng in the Stone, to ſhewe this poinct *Reſpectiue* and in the Needle, by vertue and power receiued of the *Stone*, and not forced, or conſtrained by any *Attraction* in Heauen or Hearth.

¶*The ninth Chapter.*

Of the *Variation* of the Needle, from the Pole or Axeltree of the earth, and how it is to bee vnderſtoode.

¶*The tenth Chapter.*

Of the common Compaſſes, and of the diuers different ſortes and makynges of them, with the inconueniences that maie growe by them, and the plattes made by them.

A Table or Regiment of the Sunnes declinatiõ, exactly calculated vnto the minute by the true place of the Sunne, whoſe greateſt declination for this age is 23.degrees.28.minutes, and maie ſerue for 30.yeres without greate errour.

How to vſe the Sunnes declination, for knowing the eleuation of the Polle.

Three Tables, the firſte ſheweth the coniunctions of the Sunne and Moone for 19. yeres, with the Eclipſes of the Sunne.

The ſeconde Table ſheweth the hower and minute of the opoſitions or full Moones, with the Eclipſes of the Moone.

The third Table followeth the Kalender, by the whiche is alwaies founde, what ſigne the Moone is in, with the helpe of the letters in the Kalender, alſo by the ſaied Kalender is ſhewed the hower and minute of the length of the daie, for euery daie of the yere, for the eleuation of the Polle 52.degrees.